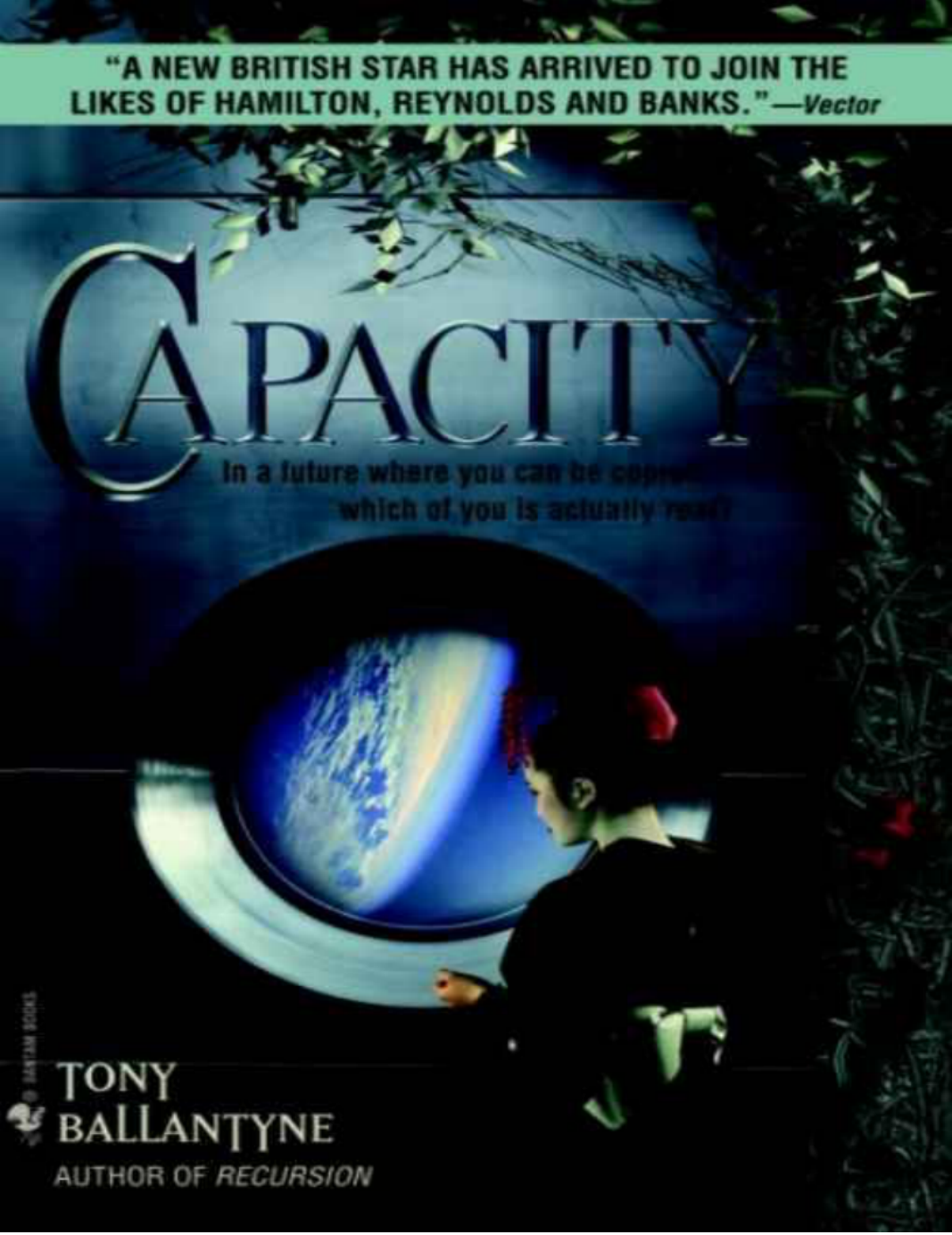
"A NEW BRITISH STAR HAS ARRIVED TO JOIN THE LIKES OF HAMILTON, REYNOLDS AND BANKS." —*Vector*

CAPACITY

In a future where you can be copied,
which of you is actually real?



BANTAM BOOKS

TONY BALLANTYNE

AUTHOR OF *RECURSION*

SHOUT
SHARE
IT

Annotation

In this uneven sequel to Ballantyne's *Recursion*, humans can live on as digital clones or "personality constructs" of themselves, leading multiple lives in the numerous matrices of 23rd-century cyberspace and enjoying equal rights with their physical compatriots. Like the first series entry, this novel interweaves several story lines concerning the dubious existence of an omnipotent artificial intelligence known as the Watcher, who controls the Environmental Agency, the organization in charge of all aspects of the digital and physical worlds. With the help of a geisha-garbed agent (and her numerous digital clones), a woman seeks asylum from a cyberspace killer determined to repeatedly torture and murder her digital incarnations. Meanwhile, on a remote planet in the physical world, a social worker investigates a series of artificial intelligence suicides that may hold apocalyptic implications. Though Ballantyne writes with engaging authority about high-concept technological novelties, the three protagonists often come across as self-parodies, spouting clumsy and predictable exposition that grinds the tale to a halt during what would otherwise have been memorable climaxes. This is a shame, because the inventive plot, which interweaves such staples of the genre as dilemmas of free will, memory and identity, contains enough mind-bending twists and double-crosses to satisfy most cyberpunk fans.

After rescue from a trap set at work, Helen is displaced in time. She is now a personality construct, or PC. Her caseworker, Judy, tells her that PCs have the same rights as atomic humans but that for the past 70 years, Helen has been running illegally on the Private Network for the pleasure of customers playing powergames. Helen vows to help Judy hunt down the head of the Private Network. Meanwhile, Justinian, a therapist for troubled PCs, is assigned to an extragalactic world where a several AIs have committed suicide for no apparent reason. It's a strange world of Schroedinger boxes, which become fixed in location only when someone looks at them, and unbreakable black velvet bands, which appear out of nowhere and shrink away to nothing. As Helen and Judy discover Private Network secrets, and Justinian slowly unravels the ever-stranger AI suicides mystery, their stories converge upon a terrifying conspiracy to hide the truth of an outer universe. Ballantyne's pacing and world-building skills make this all engaging and a bit creepy. *Regina Schroeder*

- Tony Ballantyne
  - Welcome to the Digital World!
  - Helen 1: 2240

- Justinian 1: 2223
- The Atomic Judy 1: 2240
- Justinian 2: 2223
- Helen 2: 2240
- The Atomic Judy 2: 2240
- Justinian 3: 2223
- Helen 3: 2240
- The Atomic Judy 3: 2240
- Justinian 4: 2223
- Helen 4: 2240
- The Atomic Judy 4: 2240
- Earth to Earth. Ashes to Ashes. Dust to Dust
- Interlude: The Atomic Judy 4.5
- Justinian 5: 2223
- Helen 5: 2240
- The Atomic Judy 5: 2240
- Epilogue: 2240
- About the Author

- notes
  -

Tony Ballantyne
CAPACITY

For Robin and Michael

Welcome to the Digital World!

Welcome to your new life!

Or should that be…welcome to the first day of the rest of your life?

Becoming a personality construct is regarded by many as an exciting next step in their personal development. However, it can be a little daunting, particularly if circumstances in the atomic world (or some would say physical world) mean that you do not remember making the life choice that led to this transition.

Please take a moment to read this guide and familiarize yourself with your new reality. It has been carefully ordered to minimize potential stress, so no peeking ahead! Your Social Care operative will be along shortly to assist you in the first phase of your induction into the digital world.

So, without further ado, here we go!

What year is it?

2252. This may come as a shock. Try to put it aside for the moment. Just read on…

Who are we?

We are Social Care, the branch of the EA devoted to helping humans, be they personality construct or atomic being. Medical care, education, crime and punishment, counseling, advice…it's all handled by us!

And what is the EA?

The Environmental Agency. The thing is, in the year 2252, the Earth Domain is occupied by more than just humans. There are artificial intelligences, Von Neumann Machines (machines that can replicate themselves), robots, animals, plants, insects…The EA ensures they all get a fair slice of the pie.

And who runs the EA?

It runs itself.

Not everyone would agree with this. It's a new world for you out there, and you may hear people talking about the Watcher. Some people say the Watcher runs the EA. They believe the Watcher was the first AI, and is more powerful than all the others. Some people believe the Watcher created *all* AIs, and is leading them, along with humankind, to a better future.

Others believe the Watcher is just a myth. As you can see, religious debate is alive and well in the 23rd century!

So what exactly *is* a personality construct?

Ah! That's the crux of the matter. A personality construct is simply a human mind running on a computer. Actually, "computer" is an old-fashioned phrase for an old-fashioned concept. Nowadays we say "processing space."

So I am a personality construct. Does that mean I am no longer human?

No! This is very important. Your right to be recognized as a human being was laid down after the Transition of 2171. Briefly, the Transition was the period when the EA assumed full control of the Earth Domain. Many issues relating to the rights of AIs and PCs such as yourself were established then.

Can I return to my old life?

The question does not apply. You do not have an old life. This *is* your life. Your are a sentinel digital being. The digital world is the world of your birth.

But I remember the real world!

This is *a* real world. Somewhere out in the atomic world there exists a being who had the same thoughts as you at *one particular* instant in time. Nothing more than that can be said. You can no more live in the atomic world than a chimpanzee can return to the primeval soup.

So what is the difference between the atomic and the digital worlds?

The atomic world is the world of the amoeba and cellular replication, of ferns and plants, of coelacanths and dinosaurs. It is the place where creatures crawled gasping from the sea onto the land. The place where mammals climbed down from the trees and underwent the process of evolution that resulted in *Homo sapiens sapiens*.

The digital world is the world of algorithm and recursion, the Turing machine and the Neural Net, the AI and the personality construct. It is the space where the next great steps in humankind's evolution are taking place.

Are you ready to join in the adventure?

Helen 1: 2240

Come on then; see if you can spot which ones are the true botanicals."

Sunlight dappled Helen as she raised her eyebrows in challenge to Kevin. Amongst the warm green life of the woodland glade, her tanned brown limbs and flower-plaited blond hair gave her the appearance of a nymph. She looked good, and she knew it. Kevin knew it too; she could tell. He rubbed his chin in an exaggerated fashion as he looked around the arboretum, his eyes lingering on her for a little longer than was necessary.

"Hmm, can I touch?" His voice was a delicious gravelly rumble. He waggled his eyebrows at her. "The plants, I mean."

"If you like." Helen smiled.

She leaned back against the bark of a lime tree and watched Kevin kneel down to feel the leaves of a McCusker's Miracle. She felt a little glow somewhere inside. The defined V of his shoulders and upper body, the gentle way he rubbed a grey-green leaf between his fingers: it made her wonder what it would be like if he were to fold her up in his arms. Maybe just to kiss her.

He straightened up, rubbing the leaf's metallic residue from his fingers, and caught sight of a nearby hawthorn, ragged green leaves dancing in the fresh breeze.

"No way is this one natural," he said. Helen was impressed that he was tall enough to reach up and catch hold of the end of a branch.

"Ouch!" He winced. "It has spikes! Look at that twisting effect on the trunk as well. This one is definitely a venumb."

He came back towards Helen, his dark eyes running up and down her body. For the twentieth time that day, she silently thanked the set of circumstances that had led to her drawing Kevin for the arboretum tour; thanked Lucy for asking her to swap shifts at the last moment; thanked Marek for pointing out the man who had just stepped from the Lite train.

She'd been tidying up the winged seeds display, placing natural sycamore seeds and ash keys next to the AI-designed VNM carriers used on Iota Cancri 4. Marek had raised his eyebrows at her, then deliberately turned to look in the direction of the tall handsome man who had just walked into the airy glass structure of the visitors' center. He had quickly pressed an ash key into one of her hands and the strange double-fluted IC4 carrier into the other, and then pushed her gently in the man's direction.

"Hello there," Helen had said, holding them out to the gorgeous stranger and smiling brightly. "Can you guess which was built and

which evolved?"

Her console, wrapped about her waist like a belt, was busy releasing a cloud of the maximum permissible dose of pheromones. The way the man smiled at her gave the impression that maybe chemicals weren't that necessary. Marek certainly got the hint and jumped Helen two places in the roster, allowing her to escort the man from the queue out into the warm summer of the arboretum proper.

And here he was now, gently sucking his pricked thumb, a tender gesture in such a big man. Helen silently thanked the Watcher for realizing that she was ready for another relationship by sending this gorgeous giant along. He was walking towards her now in a slow prowl, and she wondered if he was finally going to kiss her…push her against the dark tree trunk and kiss her firmly on the lips. He was reaching towards her, closer, an arrogant smile on his face…but at the last moment he bent down to touch the sprays and shoots emerging from near the base of the tree she was leaning against. He was teasing her. She liked that.

"This doesn't look right either." He looked up at her. "Another venumb. I'd say the little one over there is the only true botanical."

"Wrong!" Helen said triumphantly. "Both trees are natural. The first plant you looked at is the venumb. McCusker's Miracle. It was designed to extract aluminum from the soil. You got some of the metal residue on your fingers when you felt its leaves."

Kevin laughed as he straightened up, his big body filling her vision, and he leaned a little closer so that he was almost touching her. He smelled very clean, just a hint of cologne.

"Ah well, can't be right all of the time."

He touched Helen on the cheek; she felt a tiny flutter where his fingers brushed against her skin. He gazed at her for a moment, and she smiled…then ducked under his arm and walked over to the center of the clearing. The noon sun lanced down onto the mossy grass, and she spun slowly round in its glow, showing off her body. The light flickered as silver space-bound ships slowly ascended from the port that bordered the arboretum. A sprinkling of butterflies rose into the air and flitted away, back towards the nearby coppice.

"You'll find the best examples of the hybrid venumbs that way," said Helen, deliberately facing away from Kevin towards an area where the trees looked more mechanical. "That section most resembles the modern world," she said. "Or, if you want to see more traditional woodland, we can head in the opposite direction, towards the coppice. There's fine display of butterflies and deer there, too."

She became aware that Kevin was now standing just behind her.

"What's that?" He pointed to the edge of the coppiced area. The corner of a silver-grey cube rose above the tops of the trees.

“That?” Helen smiled. “Oh, that’s the Secret Garden.”

“The Secret Garden? That sounds intriguing.”

Kevin had moved around in front of her now, gazing at the tilted, sunken cube, half seen through the trees. About twenty meters along each side, the straight edges and clean lines of its polished surfaces were in marked contrast to the rounded organic shapes of the surrounding wood. The top of the cube glinted oddly in the sunlight where it emerged from the foliage. Helen took him by the elbow and led him forward.

“Come on, let’s go look.”

They set off towards the cube. Helen put on her lilting guide’s voice.

“The Secret Garden is a first-generation Von Neumann Machine from around the end of the twenty-first century. Unlike contemporary VNMs, these first-generation machines were built without the use of AI library code. It seems hard to believe nowadays, but humans actually worked out the replication routines themselves-” she gave a little laugh; it was part of the script, “-and more often than not, they got them wrong.”

“Humans worked out the code? I thought all that sort of thing could only be done by artificial intelligences.”

Helen smiled knowingly. “That may be the case nowadays, but back in those days the first AIs hadn’t evolved properly. That VNM almost predates AIs.”

They reached the cube and stood in the shadow cast by one out-sloping side of the huge VNM. Kevin reached out and ran his hand across its surface. His big, powerful, gentle hand.

“It feels odd, almost frictionless. It’s sort of ugly, too.” He frowned at Helen. “I’m surprised they left it here in the arboretum. It’s hardly natural, is it?”

Helen frowned. “Kevin, people have resigned over that point! The consensus is that this cube is just as natural as any of the hybrid venumbs found in here. As much a living thing as the McCusker’s Miracle you were just looking at. This cube replicates itself, just like the beeches and the willows do. The EA therefore counts it as a life form.”

“Really?” said Kevin, sounding surprised. “Do you mean that thing is still replicating?”

“Oh, yes. The original unit was seeded about three kilometers down and one kilometer west of here. Some organization wanted a complex of rooms beneath the ground, all to be protected by stealth technology. That’s what gives the cube its silver sheen and frictionless feel. Industrial espionage was rife back then, so a secure location was essential. All appeared fine at first, but someone got the telomeric

procedures wrong and the VNMs just kept replicating themselves. Rooms kept being built onto previous rooms. Go inside this cube and you're at the top of a four-kilometer-high tower that has burrowed right up from beneath the earth."

Kevin looked at the cube in fascination.

"How did it go on reproducing for so long? Why didn't they stop it?"

Helen laughed. "They didn't know it was happening! It was a stealth construction, remember? They didn't detect any activity!"

She laughed again, and the console around her waist emitted another puff of pheromones. Helen looked delightful when she laughed; she had been told as much many times. Kevin's console must have caught the spray; to be sent a puff of pheromones was a flattering invitation, but at the moment he seemed utterly fascinated by the construct.

"Can we go inside?" he asked. He suddenly switched his attention back to her and, caught by the force of his all too apparent intention, she felt her stomach flip over.

"Oh yes," she said, looking up coyly from beneath her lashes. "There is a door around the other side."

Heart pounding, she led the way along one side of the cube. Sunlight, flickering its way through the green leaves above, formed jigsaw patterns on the ground. Grass and moss grew right up to the VNM's very edge but no further, unable to get a grip on its stealthy surface.

"It's got no roof," said Kevin as they reached the other side. The tilt of the cube allowed them to see the unformed top surface of the VNM.

"Ah," began Helen, "the EA slowed the replication process right down. The thing is still growing, but now at about one billionth of its original rate. The EA does the same with a lot of the hybrid venumbs here in this park. They're technically alive, but with restricted ability to absorb any more of the arboretum's capacity."

Kevin glanced at the entrance to the cube. It had been surrounded with thick, clear plastic that formed a collar around the door-shaped hatch.

He stood back and held out an arm, using an anachronistic gesture that still had the power to charm.

"Ladies first."

"Oh thank you," Helen simpered, and stepped through the hatch. She felt a cold breeze as she did so, and a sudden stab of fear that came from nowhere.

She shrugged her shoulders. She was being ridiculous.

A rich pool of green grass lapped the walls of the cube's interior. It was as if someone had filled a tilted square bottle with green water. The process had not yet begun that would flush the cube's inside clean and start the construction of floors and internal walls. A second plastic collar, set in the grass near the far wall, enclosed a set of steps leading down to the fully formed cube that lay immediately below ground, the first of a descending sequence of stealth rooms that extended obliquely deep into the earth. Kevin followed her into the cube's interior, face now serious, *and Helen felt a squiggle of danger inside her*. She was alone with a man she had only met two hours ago. Alone in an area where her console would not work; the stealth circuitry in the half-formed walls was functioning well enough to block any incoming or outgoing signals.

Still, Social Care would know where she was. Their AIs would have seen her enter the cube; they would wait for her to exit.

Kevin walked towards her, his expression odd. Helen took a step back.

"What's the matter, Kevin?" She heard the tremble in her own voice. He reached into his pocket and pulled something out.

"Helen, do you know what a Strangler Fig is?"

Helen suddenly felt very small and alone. Though his tone was just the same as before, the warmth seemed to have completely drained from it.

"I know what a Strangler Fig is," said Helen, her attempt at a casual tone tight and forced. She was suddenly very aware of the distance to the visitors' center, of her nonfunctioning console.

Kevin held out his hand, a little white object on the palm.

"This is a seed from a hybrid venumb based on the Strangler Fig," said Kevin. "I want you to swallow it."

"Wh…why?"

"Because all self-replicating objects are valid forms of life and have a right to exist. You said as much yourself. This seed was built by the Sterkarm Company back in the mid-twenty-second century, just when the EA was bringing war to an end. This seed never had the chance to realize its potential. Here in the arboretum is the very place for it to finally do so."

Helen kept backing away from Kevin. His big powerful body that had previously looked so sexy now seemed sinister and dangerous. He was standing right between her and the door. If she could just dodge around him, she could make a run for it; if she could just make it to the outside, she could send a distress call. She played for time.

"But if I swallow the seed it will *kill* me. Isn't Social Care bothered about what happens to me?" She began to cautiously circle around

him, ready to make a break for it.

He gave her a withering look. “There are many humans, Helen, but there is only one seed. Now, stand still. I’m hardly going to let you slip around me so you can get to the door, am I?”

Helen felt sick to her stomach. That was when she noticed movement in the corner of the cube. Someone was climbing up out of the stairs that led from the level below. With a huge wave of relief she saw who it was.

“Dr. Soames! Dr. Wu! Larry! Thank the Watcher!”

She ran towards them, oblivious to Kevin for the moment. Then she slowed to a halt as she saw their expressions. They were looking at her not as a person but as an object. A piece of meat. Food for the seed.

One strong hand grabbed her around the waist from behind, another moved across her face. She felt something being pushed into her mouth, a little sting of pain, and then she was released. She tumbled to the soft earth, damp grass staining her hands and knees.

“Five minutes,” said Dr. Wu, gazing down at her impassively. “Go watch the exit, Kevin.” Kevin nodded and withdrew.

Helen felt her jaw going numb. A sharp, shooting pain ran across her left shoulder. Desperation promoted inspiration. She began running across the grass to where the upper rim of the wall was lowest, pulling her console from around her waist *and feeling along it, hand over hand, searching for the panic button*. She squeezed it hard, morphing the memory plastic of the console into the shape of a flat disc.

Kevin realized what she was doing and sped after her. Too late. She skimmed the console upwards like a frisbee towards the wall. Watched as it rose higher and higher, then started to dip. Would it make it? A sudden, knifing pain ran down her left arm, locking it in position. She could no longer move it. Dr. Soames was already at her side, taking that arm, feeling it. She pulled away from him and started across the grass again. Then her legs went numb, too, and she fell over. The three doctors strolled across to where she lay. She tried to crawl away, and now she felt the same shooting pain in her right arm as the Strangler Fig seed sent tendrils down inside it, following her veins and arteries, dipping its little suckers into them to feed on her blood. She screamed and rolled onto her back as more tendrils ran down her spine, hardening as they descended, pulling her into a new shape.

The knowledge of what was happening to her made the pain all the worse. There was an exhibit card displayed back in the visitors’ center:

THE STRANGLER FIG originated in the rain forests of northeast Australia. Its seeds were deposited on the bark of a tree in the droppings of a bird or animal. From there they worked inwards to feed on the tree's sap. Gradually the fig would grow tendrils that clung to the tree, working its way around it; each tendril dipping itself in to drink more sap until eventually a network of tendrils completely surrounded the tree, strangling it, killing it. The tree would die, leaving only the cage of the strangler fig still standing.

Now this venumb, this half biological, half mechanical device, was doing exactly the same to her. A venumb designed for use in a war that had never happened. Today it was finally being tested-on her. The pain was incredible. Where was Social Care? Couldn't they hear her cries? Another spear of agony seared through her body, jerking her head back. She could see her console lying on the grass over there. It hadn't made it over the wall. Someone's feet moved into her view and she heard a voice.

"Look-the first protrusions from her skin. Is that metal or wood?"

Someone else knelt down by her.

"Metal, I think."

"Don't touch them," cautioned a third voice urgently. "They may contain seeds, too. Secondary infection of any soldiers who came to the victim's aid…"

Helen screamed again. A throbbing pain was building in intensity beneath her skull as the fig's tendrils searched for a way in. There was an explosion of light…

Level One

A rich pool of green grass lapped the walls of the cube's interior. It was as if someone had filled a tilted square bottle with green water. The process had not yet begun that would flush the cube's inside clean and start the construction of floors and internal walls. A second plastic collar, set in the grass near the far wall, enclosed a set of steps leading down to the fully formed cube that lay immediately below ground, the first of a descending sequence of stealth rooms that extended obliquely deep into the earth. "Can we go to the level below?" Kevin asked. He gave her a significant look. "It should be more…private down there."

Helen wordlessly took his hand and led him across the sunlit interior of the roofless cube to the plastic collar set in the earth.

The first room beneath the ground was a fully functioning stealth area; it wanted to maintain its integrity and that meant sealing the hatch to the surface. Rather than disable the room in any way, the arboretum had placed the plastic collar in position to stop the door to

the outside world from closing totally. Helen made her way down clear plastic steps, her shoes squeaking on the nonslip surfaces. She felt a little thrill as Kevin's body blocked out the light behind her. She wondered what he had in mind.

The steps led to a grey rubberized floor that sloped gently down towards one corner of the room.

"*Everything in the cube is at a slant,*" *Helen said.* "*Progressive leveling error in the initial parameters of the original VNMs.*"

Kevin didn't seem to be listening. He prowled around the room, tapping at the walls and feeling along the edges of the several raised platforms that filled the interior of the room.

"*Got it,*" *Kevin said, tapping one of them, and Helen suddenly felt very small and alone.*

"*Got what*?" *she asked. Her mouth felt very dry.* She had a sense of retreating from her real life up in the world above. Hemmed in by grey rubberized walls, by ancient machinery and hidden software, she suddenly felt stifled. She thought of the climb up the plastic stairs to the surface, of the long lines of poplars, the dappled collections of broadleaves awaiting autumn, the paper delicacy of the groves of Japanese maples that stretched between herself and the visitors' center…

"*What's the matter with you*?" *Kevin said.*

"*N…Nothing,*" *Helen stuttered.* "*What have you found*?"

"*The isolation room.*"

Helen felt a squiggle of danger inside her.

"They always built them inside these old cubes. Failsafe. If anyone managed to violate the integrity of the outer skin they would find nothing of interest. Everything that was really important went on inside the isolation room."

He tapped the floor and a panel sprang open. Helen caught a glimpse of a mirrored cubicle, big enough to seat four people.

"I never knew that was there," she whispered. "How do you know so much about this cube?"

"Part of the job," Kevin said. "Helen, I want you to go inside."

Helen found herself drawn closer to the entrance to the isolation room. She would have to stoop to enter it. Once she was in there, would she be able to get out?

"I don't want to go in," she said.

"Don't be silly," Kevin said. "It's perfectly safe."

Helen peered cautiously through the door. Kevin placed a hand on her back and gently but firmly pushed her inside.

"Hey…" she said, turning to him. He filled the doorway.

"I'm going to lock you in here."

Helen didn't waste time with words. She flung herself at him. As

he reached out to catch her, she caught his arm and twisted. She heard him grunt with pain just as she felt the sting in her leg.

Her body went limp.

"Relaxant," Kevin said. He dragged her back into the cubicle by her arms and propped her in the corner.

"Good move there on the arm, Helen. You really hurt me. Some of our customers here will like that."

Helen looked at him. Her lips felt numb; her words became mushy and half formed.

"Wht cstmers?"

"You'll find out."

"Sshl Cr."

"Social Care?" Kevin laughed. "No chance."

"Knws m here."

"They don't know you're here. That's part of the stealth technology of this cube. The people who designed these things didn't want it advertised who might be attending meetings inside them. As soon as you come within range of this cube, it creates various ghost objects on any senses observing in the vicinity. It will appear as if you never came in here. You simply vanished into the woods."

"No."

"It's true. Social Care may have all the best AIs working for them, but the senses it relies upon are just the same as those used by everyone else."

Kevin looked at his watch. "Anyway, got to go. Someone will probably be along in an hour or so."

"Wt!"

Too late. The door slid shut. Helen lay helpless in the corner of the room, looking around the mirrored walls at the slumped shapes reflected all around her. She could feel dread rising from them, filling the mirrored room to capacity.

Level Two

The steps led to a grey rubberized floor that sloped gently down towards one corner of the room.

"*Everything in the cube is at a slant,*" *Helen said.* "*Progressive leveling error in the initial parameters of the original VNMs.*" It was all she could do to keep the longing from her voice. She could feel an aching between her legs when she looked at Kevin.

"Let's go down another level," he said, giving her a knowing smile.

He pressed down on a section of the floor and a hatch opened up.

"How did you know about that?" asked Helen.

“I read up on this sort of stealth cube before coming to the arboretum,” said Kevin.

They descended to the second cube below the ground.

“So what do you want with me down here?” she teased.

Kevin didn’t seem to be listening. He prowled around the room, tapping at the walls and feeling along the edges of the raised platforms that filled the interior of the room.

“*Got it,” Kevin said, and Helen suddenly felt very small and alone.*

“*Got what?” she asked.*

“*The isolation room.”*

Helen felt a squiggle of danger inside her.

He tapped the floor and a panel sprung open. Helen caught a glimpse of a mirrored cubicle, big enough to seat four people.

There was someone in there.

Level Two, Variation A

Kevin took hold of Helen’s arm and pulled her into the room. A woman sat on the floor, gazing up at Kevin with a hopeless expression.

“Good afternoon, Mona. I’ve brought you a friend.”

Mona looked at Helen with an expression of fear and pity. Helen’s sense of foreboding turned to alarm. She recognized the woman who sat in the corner of the room, gazing up at Kevin with empty eyes.

“That’s Mona Karel. She vanished two months ago. Nobody could explain how!”

“Well, now you know,” said Kevin. “They’ll be talking about you in the same way this time tomorrow.”

He pressed his hand against Helen’s cheek. As he took it away she saw the skin on his fingers was dyed blue.

“Relaxant,” he said as Helen slumped to the floor beside Mona.

Kevin looked down at them both, then checked his watch.

“Mona, your next customer will be arriving in about four hours. Helen, you can learn what’s expected of you by watching Mona. You’ll be on duty four hours after that.”

“Please,” Mona said. She was shaking. “Please, no.”

Kevin smiled and the mirrored door slid shut.

Level Two, Variation B

Kevin took hold of Helen and pulled her by the arm into the room. A woman walked towards Kevin and kissed him on the cheek.

“Hey,” said Kevin. “You’re not Mona!”

The woman who had kissed Kevin placed a hand on each of his

shoulders and gazed into his eyes. She had long, straight black hair, pulled into two halves so they looked like the carapace of a beetle. At the nape of her neck the hair was wound into a complicated bun arrangement held in place by a thick horizontal rod of lacquered wood.

Her face was utterly white save for her black lips and eyes that seemed to float over that white space, unattached. When she opened her mouth, a living red tongue ran across brilliantly white teeth. When she blinked, black lashes swept down over black irises. She wore a black kimono from which white hands and feet with black-painted nails emerged. She should have been terrifying. Instead, Helen found her strangely beautiful. When she spoke, her voice was soft and lilting, her accent vaguely Irish.

"Good afternoon, Kevin. Remember me?"

"Judy! How could I forget?" He had not been expecting this woman to be in the room, that much was obvious, but who would expect someone who seemed like a cross between a black-and-white geisha and the most sinister clown from their childhood? Strangely, Kevin seemed quite unconcerned. He casually looked around the room, searching for something.

"If you're looking for Mona," the woman said, "she's somewhere safe, being counseled by Social Care."

Helen looked on, a sense of unreality settling on her like snowflakes. Truth be told, things had seemed rather strange since she woke up that morning: the world just a little too bright, the colors just a little bit too simple. But this was a step too far. Kevin reached out into the space immediately before him and began to twist his hands, as if searching for something.

"No point activating the escape hatch," said the woman. "I've taken control of this processing space."

"Ah," said Kevin. He put a hand in his pocket and pulled out his console.

Helen looked from Kevin to the black-and-white woman, utterly confused. Kevin still seemed quite relaxed.

"No problem," he said. "There's always a failsafe."

He pressed his console and vanished. Helen jerked backwards in surprise, banging into the mirrored wall behind her.

The black-and-white woman turned to look at Helen.

"I'm Judy," she said. "I don't think we've met yet, Helen."

Helen gazed at the woman for a moment, her lips moving silently. She suddenly understood.

"I'm a personality construct, aren't I? This isn't the real me any more."

Judy's black lips formed into a smile.

“You’re not as sentimental as your personality profile makes out, are you? No matter how many readings Social Care pass on to me, they never give the same feel as actually meeting a person. Each time I’ve met you, you’ve faced up to reality straight away.”

Helen bit her lip thoughtfully. “Each time we’ve met?” she said. “There is more than one copy of me?”

“Oh yes, you’re very popular in this little chamber of horrors.”

Judy’s console made a shushing noise, and Judy tilted her head a little, clearly listening to something.

Helen opened her mouth, and Judy raised a hand to silence her. Helen looked around the mirrored chambers, at all the black-and-white women who raised their hands to the young blond women, images receding into infinity. Helen had a sudden sense that she was not looking at reflections; that, instead, each of the pairs of figures that she saw was another Helen and Judy, trapped in another computer simulation. Each one of them awaiting some dreadful fate.

Judy lowered her hand.

“Kevin has shown up on one of the Level Three simulations. I’m going to intercept him. Helen, you will be safe within the stealth cube area for the moment. Don’t wander too far into the arboretum; the simulation only extends for a few hundred meters beyond the limits of this construction.”

“But…” said Helen.

“Read this while I’m gone.” She thrust a thin plastic pamphlet into her hand.

“What…”

It was too late. Judy had vanished. Helen looked down at the pamphlet. Written along the top were the words “Welcome to the Digital World. Welcome to your new life!”

Level Three, Variation A

Helen crouched in the corner of the mirrored room, knees pulled up tight against her chin, arms hugging her shins. She guessed she had been trapped in the room for about six hours now. Long enough to make herself hoarse, shouting for help. Long enough to realize that Social Care weren’t coming. Long enough to realize that she faced the awful prospect of being a victim to those crimes she had thought were only vicarious entertainment on historical shows. Rape. Murder. Torture. She gazed at nothing, not wanting to look into the terrified eyes of the other Helens who shivered around her. The wide eyes, the pinched cheeks, the pale faces all served to amplify her own fear.

“Watcher,” she whispered. “If you are there. If you really exist. Please, please. Help me.”

Then there came the noise of the seals in the door disengaging. Helen whimpered with fear. How much would it hurt?

A thin, unshaven man stepped into the room, his eyes lighting up with excitement as he saw Helen.

"Please," Helen said. Reflexively she felt for her console, but it was no use; Kevin had taken it away when he had first pushed her into this place.

The man giggled. "Say it again," he said. "Say please and I might be nice."

Helen felt something inside herself harden. She pushed herself upright against the wall, gazing at the man's fingers as she did so. He didn't look so strong, really. Maybe she could get behind him, hold his blue-stained hands away.

Too late. With a speed that took her by surprise, he lashed out, brushing his fingers against her cheek. She felt her legs give way.

The man stood back and looked down at her thoughtfully.

"Now," he said. "Where shall we start?"

"How about with a profile readjustment?"

The man jumped at the voice.

A woman stepped into the room. Black hair, black lips, white face. The sight of her terrified the man.

"No," he croaked. "You don't understand. This is not what it looks like…"

The woman smiled. "Hello, Helen. Hello, James. My name is Judy. I'm-"

The man's face crumpled. "How did you know my real name? They told me that my anonymity would be assured."

Judy rolled her eyes. "James, *they* are running illegal personality constructs. *They* are collaborating in the torture and murder of said constructs. I think it may be a fair assumption that *they* are not the sort of people to be trusted when they tell you that your anonymity is assured."

The man stared at Judy, trying to understand the full import of what she had just said.

Helen was a lot quicker on the uptake. "You mean this isn't real? I'm a personality construct?"

"I don't know about real," Judy said. "It *is* true that you are a personality construct. According to your time frame, you were copied by a Marek Mazokiewicz two days ago. You're being run, illegally and without your consent, so that people like James here can get their rocks off torturing you."

Helen wasn't listening. She was still focused on the first part of the sentence. "According to my time frame…" she said slowly. A yawning feeling opened up in her stomach.

Judy shook her head sadly. “According to atomic time, you were copied seventy years ago. You’re just the latest in a long line of Helens. I’m sorry.”

Helen felt a pang inside her. She forced down the welling nausea for the moment.

“Why?” she asked.

“Why were you copied? As I said, so that people like James here could play with you. Torture you. Isn’t that right, James?”

“No,” said James. He began to wring his hands. “I wasn’t going to do anything like that. I just wanted to know…wanted to know…what it would be like…”

Helen felt contempt rising inside her. She dismissed James from the conversation.

“What happens now?” she asked Judy.

Judy tilted her head. “That all depends.”

“On what?”

Judy looked at James. “The people who run this place know that their cover is blown. They’ll want to destroy the evidence. What happens now depends on whether *they* manage to wipe the processing space in which we reside, or whether my atomic self manages to stop them.”

Helen licked her lips. “Do you think you will?”

Judy smiled and nodded. “I always do. We’ve been dealing with the Private Network for some time now. One of my digital alter egos is hot on the trail of Kevin-one of the Private Network’s leaders-right now. They won’t do anything to harm the simulation while he’s still in here.”

James slumped hopelessly into a corner of the room.

Helen gazed at Judy. “Digital alter egos? You’re going to have to explain that…”

Judy fingered the black sleeve of her kimono.

“There are twelve of us,” she said. “Twelve digital Judys. And then there is our other sister, living out in the atomic world. For the sake of convenience, I’m sometimes called Judy 3.”

“Judy 3?” said Helen.

“You can call me Judy.” She tilted her head, listened to her console, which was set in the form of the black rod threaded through her hair. “Here we are. My sister has just caught up with Kevin…”

Level Three, Variation B

Judy 4 stepped into the isolation room. Kevin was already here, struggling with Helen. Calypso, the woman who had booked the session in the trap, was lying on the floor, feebly trying to get up.

Judy paused by the door, letting events run their course. As she watched, Helen slumped to the floor. Kevin noticed Judy and gave her a smile.

"Hello again," he said. He nodded to Helen on the floor. "She's very clever," he said. "She grabbed hold of Calypso's hands and rubbed the relaxant on me. She couldn't know that the simulation is programmed to exclude me from the effects."

Judy's face was deliberately impassive.

"She's very tenacious, Kevin. I'm really coming to admire her."

"That's why we pick her for the traps. Big favorite with a certain sort of man." He looked down at Calypso. "And a certain sort of woman," he added.

"Fk ff," Calypso murmured.

Kevin rubbed his chin, thoughtfully. "I don't seem to be able to exit from this space at all."

"We've got your measure now," Judy 4 said.

"I didn't think that was possible." Kevin frowned.

Judy pulled a little blue pill from the sleeve of her kimono and swallowed it.

"It is possible," she said, "if we isolate the space completely. Nothing gets in and out now. Not even me."

Kevin shrugged his shoulders. "Ah, well. There is still one way out."

"I don't think so."

"Watch me," whispered Kevin. His smile froze as he slumped slowly to the ground.

Judy 4 stared at him for a moment, her white face motionless. Only the slight widening of her black eyes displayed the horror she felt.

"Wht? Wht s it?" Calypso said. She was gazing up from the floor where she lay. "Wht dd he do?"

Level Three, Variation A

"What's the matter, Judy?"

Helen leaned close to Judy 3 and took hold of one of her white hands. For something that seemed to be barely there, the hand felt very warm.

"Judy, what is it?"

"He killed himself," she whispered. "Overwrote the personality space he inhabited with null events."

James spoke up from his corner in a whining voice. "So what? Let him die. Who cares?"

Judy 3 turned and gave him a sweet smile. "*You* should care,

James. Now that Kevin has left this processing space, there is no reason for the Private Network to maintain it. Let's just hope my atomic friends get an exit into here before we're all wiped."

Helen moved her lips, thinking aloud.

"Surely they will have a backup of this processing space? Couldn't they just run that?"

Judy 3 had been gazing at her reflection in the mirrored walls of the isolation room. She turned and gave Helen a significant look.

"Ah, now you've hit on the crux of the matter, Helen."

Level Four

Judy 11 stepped into the isolation room on Level Four and held her breath, expecting the worst. The scenarios on this level did not bear contemplating. To look at them awoke a boiling anger that slowly cooled into thoughts that left her feeling weak and ashamed.

In this room there was a table, a little tray of silver instruments at one side of it. A man was looking at the instruments thoughtfully. He turned as Judy appeared.

"Hello, Judy," he said.

"Who are you?" Judy 11 asked. "Where's Helen?"

"Never mind that," said the man. "We need to talk, and quickly. I've been trying to get a message to your atomic self, undetected, for months now. This may be my last chance."

Judy 11 laughed sardonically.

"You could have picked a better place. This processing space is going to be shut down at any moment, with all of us in it. I'm doing a last sweep for anyone who may be trapped in here, in the vain hope that we may be able to get them out in time."

"Never mind that," the man said again. "What I've got to say is far more important."

"I doubt it," Judy said.

The man took hold of Judy's hands and gazed into her black eyes.

"Judy, listen to me. When word of this gets out, it could bring down Social Care, the EA, even the Watcher. It changes everything we've been led to believe. There's been a murder."

The edge to the man's words touched something in Judy. He *believed* in what he was saying.

"Who has been murdered?" she asked crisply.

"That's not the problem. The problem is the murderer. They've killed once; they're going to kill again. The murderer has to be stopped, and I don't think that that's possible."

Judy 11 was calm.

"Nothing is impossible. Who is the murderer?"

The man swallowed. He looked around the room, as if afraid of who might hear his words. When he spoke, it was in a hoarse whisper.

“The Watcher.”

Justinian 1: 2223

Only three weeks had elapsed since his arrival on Gateway, but Justinian was increasingly wondering why he was still there. At 5 A.M. subjective time his frustration was the only thing that could compete with his exhaustion. Standing at the rear of the flier, the exit ramp slowly dropping away into the early morning, he gave a half yawn, half sigh as he shifted the baby on his hip. His son pointed at the darkness revealed by the opening ramp and turned to face him.

"Bah buh bah," said the baby earnestly. "Bah buh bah!" A stinking breeze twisted into the cabin through the widening gap, scattering grass seeds before it: a bad-breath yawn that matched Justinian's.

As the ramp dropped further, the flier's exterior lights came on, illuminating a long sloping finger of mud that slid down into black water. Justinian wiped his sticky eyes with one hand and set off down the exit ramp. Outside of the calming yellow glow of the cabin that had been his home for the past three weeks lay a psychedelic world. The flier's lights cast garish highlights and shadows on the red mud; white light reflected off the dark mirror of the water. The whole became a jumble that jangled his tired mind. The green bean shape of the AI pod lay half buried about thirty meters away, white grass seeds blown all around it.

Halfway down the ramp, Justinian realized he was alone.

"Aren't you coming, Leslie?" he said, turning to face the grey smudge of the robot who was watching from just inside the ship's doorway.

The robot's voice was apologetic. "Sorry. I can't get a grip on the mud with these feet."

A grey blur of movement was the robot's arm pointing to its foot. It was difficult to make out anything for sure about Leslie through his fractal skin, the ten-centimeter region around the construct that could neither properly be described as robot, nor the rest of the world, either. Leslie claimed that it served as a cordon sanitaire; Justinian darkly suspected it was just another excuse for avoiding work.

"Fine," he said sharply, walking quickly back up the ramp. "I'll go alone. You stay and watch the baby."

Justinian dumped his son into the robot's arms, then slipped and slithered his way out onto the red mud, the bright light and dark red surroundings making him feel as if he was still dreaming. Iridescent patterns bent and warped as he placed his feet on the slick surface, splashing up reddish drops that slipped rapidly from the frictionless surface of his clothes. The rich organic stench in his nose matched the

farting of his feet in the mud. Up till now Justinian had visited fourteen pods around the planet, and this one was in by far the most unpleasant location.

The AI pod rested in a little indentation in the bank. It seemed almost unchanged from its dormant state: a smooth fluorescent green kidney bean the size of Justinian, had he taken it into his head to curl up in the fetal position there in the stinking mud. Three Black Velvet Bands had wrapped themselves around its surface and a few Schrödinger boxes were scattered across the mud before it.

"Hello," said the pod.

"Hello, I'm Justinian."

"Hello, Justinian." The pod's voice was eager, like a child fascinated by the world. "Have you seen these little boxes? As soon as you take your eye off any of them, they jump to another position. But as long as you are looking at them, they stay put."

"I've seen them," said Justinian, fed up with the pod already. He had been conducting interviews all over the planet, asking the same questions over and over again, each time receiving exactly the same answers. It was getting tedious beyond belief. For this pod, of course, it was all new.

"Do you know what they are?" it asked. "They're amazing!"

"They're called Schrödinger boxes," Justinian said carefully. The pod wasn't fooled.

"Ah! So you don't actually know what they are either. Maybe you can tell me about these bands wrapped around my shell. Do you know what they are, or do you simply have a name for them?"

Justinian was too tired to be insulted. Besides, it was all part of the script.

"We call them Black Velvet Bands, BVBs for short," he replied. "Look, I've got one in here."

He pulled the plastic rod from the thigh pocket of his passive suit and waited a moment for the pod to scan it.

"Very interesting," it said. "Where did you find it?"

"The plastic rod is a table leg. One of the other colonists found the BVB wrapped around it as they were sitting down to breakfast one morning."

"One of the other colonists? How many are there now on Gateway?"

"Still just a hundred. And me, of course."

Justinian gave an involuntary shiver as he said these words. It reminded him how far he was from home, and Justinian felt doubly alone. Here he was, standing on a remote mud slick, lost on a planet that floated between galaxies, and yet he felt himself an outsider to the only group of humans for millions of light years. The bright blue

belt of M32 rose into the dark sky behind the pod. The Milky Way was a monochrome rainbow in the other direction.

Justinian rubbed a finger across the fuzzy surface of the BVB and wondered at the strangeness of this place. As far as he was concerned, reality was a force that diminished the further one traveled from home: the hundred colonists were treading in a place of dreams where nothing worked as it should. Neither should it be expected to.

The pod spoke in a thoughtful tone. “I don’t remember anything about BVBs. I wonder why that is?”

“Probably because they weren’t known when you were conceived. They were only discovered on this planet.”

Justinian crouched down before the pod, looking for external sense cluster formations. There seemed to be nothing. That implied the pod was still operating on internals. Just like all the other pods, in fact.

“BVBs are similar to the Schrödinger boxes,” he continued, his hands glowing fluorescent green as he felt the rubbery surface of the pod. Red mud squelched under his feet and he grabbed onto the pod to maintain his balance. “BVBs only form in spaces that are not being observed, and then they immediately begin to contract.”

“How do you know?” the pod interrupted.

“How do I know what?”

“How do you know that they begin to contract immediately if the space in which they form is not being observed?”

Justinian smiled wearily.

“Good point,” he said. “I hadn’t thought of that before.” He was struck by how much like children the AIs here on Gateway had become. Innocent, but with a sharp eye for detail.

“Someone probably did; they just didn’t explain that part to you.”

Justinian gazed coolly at the pod. And like children, he thought, they could be incredibly tactless. They quickly figured out that Justinian wasn’t part of the scientific survey team and then equally quickly lost all respect for him.

His legs were getting tired from crouching, so he straightened up and began to circle the pod, treading carefully on the slippery mud. One careless step and he could end up rolling down the slope into the dark water below.

“Anyway,” he said, “BVBs form in empty spaces. We *believe* they begin to contract immediately. Sometimes they get tangled around an object, like a pipe or a tree branch. The slightest touch on their inside surface stops them contracting; *nothing* can make them expand again. And they’re unbreakable. Nothing can cut through them.”

“Oh…” The pod’s voice was almost wistful. “What does BVB stand for?”

“Black Velvet Band. Named after an old song, apparently.”

Justinian rested a hand on the warm surface of the pod. He looked at the three BVBs that had formed on its supple skin. “If you rearrange your external structure to make your skin frictionless, they’ll slip right off.”

There was a moment’s pause before the pod spoke.

“…I can’t.”

“You can,” Justinian said. “All AI pods have multiform integuments. Yours is just set to dormant mode at the moment. Wake it up.”

“I can’t,” the pod said. It sounded embarrassed. “I don’t understand how to work the mechanism. I can see the potentials arranged before me, but I don’t understand how to achieve them.”

Justinian yawned again, looking out across the water. A pale glow had appeared over there as dawn approached. He wondered if he could make out the shape of another mud bank, slowly materializing from the blackness.

“You’ve heard all this before, haven’t you?” the pod said shrewdly. “Who are you? Why are you here? You’re obviously not one of the regular surveyors.”

There it was again: all the pods so far had figured this out. They might be acting like children, but they still had intelligence at least equal to his own. And, stripped down though their intelligences were, they still had access to vast libraries of data. Data that covered many, many subjects. How to read body language would be just one of them.

Justinian played it straight. “My name is Justinian. I’m a counselor. I’ve been brought to Gateway to try and figure out why AIs aren’t thriving here.”

“A counselor?” said the pod. “The sort that uses the empathy drug? You’re an MTPH counselor?”

“Originally. I work mainly with personality constructs nowadays.”

“Personality constructs? Does that make a difference?”

“It shouldn’t. You have to retrain in the use of MTPH-”

“I suppose that’s one reason for sending you here to speak to me,” the pod said thoughtfully. “Still, I would have thought the reasons for my failure would be beyond human intelligence. I would have thought the investigation would be a job for an AI.”

Justinian let sarcasm lace his voice. “You’d think so, wouldn’t you? The trouble is, AIs don’t seem to want to work on Gateway. So far I’ve interviewed fourteen of the thirty-two pods that were seeded here. All of them have been exactly like you: drastically reduced versions of their former selves. Virtual suicides.”

The pod seemed unbothered by his tone. “Really? So it wasn’t just me, then…”

The pod was silent for a moment. When it spoke, Justinian thought there was an edge of fear to its voice. That was silly, of course. The pod could make its voice sound however it wanted.

"So that's why they sent a human. But why you, I wonder? There's more, isn't there, Justinian? There's a reason they chose you in particular."

Justinian stifled another yawn and looked towards the dark shape of the flier, lost behind the bright lights that illuminated the pod. He thought longingly of his bed.

"I counsel potential suicides," he said. "Specifically, I counsel personality constructs who wish to wipe themselves from the processing space in which they reside."

"Give me an example."

"Why can't you look one up for yourself? Your databases are intact, aren't they?"

"You know they are. You're testing me, aren't you? Well, now I want to test you. Give me an example of the way you work with human PCs."

Justinian rubbed his hands together uneasily. Even after fourteen other pods had asked him exactly the same question, he still felt uncomfortable about opening himself up to one. He was used to having his personality read by AIs-what twenty-third-century person wasn't? — but this was different. This pod had got halfway through its development cycle and then, for no apparent reason, wiped out all its higher brain functions. Just like every other pod on Gateway. He was dealing with an unstable personality. And that was frightening. Everyone knew that AIs could make you do what they wanted you to, without you even knowing it. Those of a more paranoid frame of mind believed that the Watcher itself was only giving the human race the impression of free will. They believed that it was in reality driving humankind towards its own, inscrutable goal. AIs could always force you to choose the card they wanted, and the one in front of Justinian was unstable. What might it choose to make him do? Maybe Justinian would just suddenly, inexplicably take it into his head to step off this mud spit into the dark water below. What if he were to now swim off into the cold night, to sink into the blackness, to drown in the dark all alone, light years from home?

The pod noted his hesitation. "What's the matter, Justinian? You're asking me questions to figure out why I've malfunctioned. Why should I not do the same to you?"

"Because I haven't malfunctioned," Justinian said. "Nonetheless, I'll tell you about Leigh Sony. She had Cotard's syndrome."

"Cotard's syndrome? No, tell me about one of the personality constructs that you counseled, not a real person."

"Leigh *was* a construct," Justinian said. "That was the problem."

Leigh looked up as Justinian stepped into the room. Once again he was struck by the apparent reality of the modern VR interfaces. If he concentrated, he could feel the slippery touch of the interface mesh he wore at the back of his neck, but that was about it. Directed electromagnetic fields were manipulating his nervous system and were reading what was written there, even as far down his body as his arms and legs, giving him the impression that he really was standing in the hospital ward. The sharp smell of antiseptic and healing accelerants seemed to jumble with the light reflected from the white surfaces.

"*Hello, Justinian.*"

"*Hello, Leigh.*"

She smiled up at him politely: white hair, wrinkled face, gentle brown eyes. She looked a lot older than her fifty-four years.

"*It's good of you to come, Justinian,*" *she said.* "*Hardly anyone has spoken to me since I died last month.*"

Justinian sat down on the plastic bed next to her chair and took her hand.

"*You're not dead, Leigh. You are still a living being, both in fact and in the eyes of the law.*"

Leigh smiled at him politely. "*You are very nice, Justinian, but I know that I am dead. I was trying to think of the ages of my grandchildren just before you came in, but I could only remember the ones who were older than me. That's not right, is it?*"

Justinian rubbed her hand gently. "*No, Leigh. But it is an indication of Cotard's syndrome.*"

"*You counselors and your fancy terms. I die and you call it Cotard's syndrome.*"

"*No, Leigh. Cotard's syndrome is an illness, a result of severe depression or neurological disease. You haven't died.*"

Leigh gave a gentle smile, humoring him.

"*It's all the same to me. Now, how is your wife? How long before the baby is born?*"

"*Six weeks.*"

Justinian bit his lip. Leigh squeezed his hand with hers. It felt very dry, hardly human, as if she were dead already.

Leigh gave a warm smile. "*Six weeks? It's your first, isn't it? You should make the most of your free time now; it will all be different when the baby is born.*"

Justinian smiled. "*So everyone keeps telling me. Tell me, Leigh, do you remember how old you were when you became a personality construct?*"

Leigh laughed. "*Personality construct! You've got a phrase for everything, haven't you? I told you, about a month ago.*"

Justinian was ready for this. He used his console to open a viewing field on the wall next to where Leigh was sitting. A blue-green series of misshapen concentric circles appeared there.

"*No, Leigh, I'm not talking about when you think you died. I mean, do you remember when your atomic self had a copy of herself made?*"

Leigh smiled patiently at him.

"*I'm telling the truth, Leigh,*" *he said, glancing away from the viewing field to make eye contact with her.* "*Let me remind you: you were separated thirty-one years ago when the atomic Leigh Sony was twenty-three. That's your visual representation on the viewing field there. Can you see your key code in it?*"

Leigh looked at the VRep without interest.

"*I don't think so, Justinian. How can you simulate death in a processing space? I'm not a personality construct. I'm a dead woman.*"

"*You're a PC, Leigh. Getting you to accept that is the first step in your rehabilitation.*"

Leigh rubbed her lips. "*I can taste metal and strawberries,*" *she said.* "*That's the worst of being dead. I keep smelling roses, too. They're the flowers on my grave.*"

"*No, they're a sign of the tumor growing in your brain.*"

Leigh gave him a sharp look. "*I thought you said I was a PC, Justinian? How could I have a tumor?*"

"*Virtual people have virtual illnesses, Leigh. You know that. They live and die; they get ill just like everyone else. You've got to face up to that if you're going to get better.*"

"*Why?*"

"*Because that's how the cure works. That's how I work. You've got to admit you have a problem before it can be solved.*"

"*No, I mean why do I have to get ill and die, if I'm a PC?*"

"*Because…*" *began Justinian.* "*I don't know why. Ask Eva and the Watcher. They're the ones who-*"

"You don't like the Watcher, do you?"

Justinian felt a sudden sense of dislocation, his memories had been so vivid. The edge of the sun peeped over the horizon, spilling yellow light across the world. Water lit up in brilliant silver curves that curled themselves around the black crescent-shaped mud banks of the estuary. Justinian was in a world of sharp contrasts, of bright light and black shadow, real and imaginary, familiar and alien. The curved shape of the AI pod was half fluorescent green, half mottled darkness.

"What did you say?" asked Justinian.

"I said you don't like the Watcher, do you? It's obvious from the way you told the story."

Justinian gave a snort of derision. "I don't have any strong

feelings for the Watcher one way or the other. Why should I? If it exists, the Watcher is just a fact of life. You might as well say I don't particularly like the moon. All those tides it causes…"

The pod laughed. "You say that, but I think you're not being truthful to yourself. Interesting. It could explain a lot."

"Explain what?"

The pod didn't answer.

"What happened to Leigh?"

"I was trying to tell you…"

Justinian got the call a week after his last visit to Leigh Sony. He was in a public processing space at the time, counseling a sixteen-year-old who had had himself replicated and was now regretting it.

"*But, Loja,*" *he was saying,* "*the atomic Loja is another person, alive and well in the atomic world. This processing space here is where you live. The digital world is as much your natural environment as the atomic world was at your birth. There's no going back.*"

Justinian's console gave a shushing noise. It was Aelfric, his colleague from the Southern Europe sector.

"*Justinian,*" *said Aelfric,* "*I've got some bad news. It's about Leigh Sony, from EA Public Space number four. She's killed herself.*"

Justinian felt nothing, not even numbness. He merely stared at the man in the viewing field.

Aelfric shook his head. "*Half an hour ago. Managed to find the handle of the destructor routine by peeling away her brain with a scalpel. Got it a good way in, too, before she interrupted the motor routines in her arm. It was very messy.*"

"*Aelfric, do you have to be so graphic? She was a living thing.*"

Aelfric looked chastened. "*Sorry, Justinian. But you know the case better than I do-Cotard's syndrome. She thought she was already dead.*"

"*I know. How did she fool the hospital, though? Surely they saw it coming?*"

"*No. Her mood swings were too extreme. They couldn't predict it.*"

"*She shouldn't have been let anywhere near the equipment.*"

Aelfric nodded slowly. "*Tell me about it. Look, I've been assigned to you for the short term. Would that be okay?*"

"*You might as well, Aelfric.*" *Justinian's eyes were burning.* "*You're a good counselor. Better than one of those fucking machines…*"

Back on Gateway, Justinian had the impression the pod was letting him know it had scored a point. It was an AI: it could force you to feel things, do things, even realize things about yourself that you didn't want to. Okay, so he didn't like the Watcher. He had always avoided thinking about that in the past, and now the pod had caused

him to face up to the fact. Each pod he had met so far had done the same: forced him to face up to some aspect of his personality. Everything from his jealousy at his sister's success to his feeling of failure for not doing better at school. This was home truth number fifteen. He just didn't like what the Watcher did to personality constructs. It troubled Justinian's personal worldview that the most intelligent being known to humankind, if it really did exist, would choose to inflict suffering on sentient beings.

The pod was reading his discomfort: it now paraphrased the words originally attributed to the Watcher.

"She was a human personality construct, Justinian. If she lived forever, she wouldn't be human. If she never got ill, or ran the risk of illness, she wouldn't be human."

"That's not an excuse."

"It's all that you're getting."

Justinian gave a mental sigh of relief that this section of the interview was over. To have an AI dip so deeply into his mind-what damage could it have done? Was there any way of telling? Now Justinian called up the visual representation of the pod's intelligence on a narrow-beam viewing field from his console. The pod shouldn't be able to see it, but it could probably read by his reactions what he was doing. It would no doubt mention the fact in a moment.

There were no clues there. The pod's VRep looked just the same as those of all the other pods he had examined on this planet: concentric bands of color vanishing into infinity at the center of the image. The picture always reminded Justinian of a cross section of an incredibly old and gnarled tree trunk. On cursory inspection there was nothing unusual there: it was an apparently sane and healthy personality. There were no clues here to its creation…

"Does my VRep give you any clues to why I committed suicide? I feel like I'm rattling around the inside of this case, just looking for answers."

"No, nothing. Do you realize that you have exactly the same personality construct as all the other AI pods I visited? It's like you all agreed on a common template before you wound yourselves down. All of you answer my questions in the same way."

"Is that your child I see, there in the hatchway to the flier?" asked the pod, changing the subject. *Nobody likes to be told they're not an original.* Justinian looked towards the flier. The craft's lights were dimming as the sun rose. Leslie was standing just inside the rear hatchway, gently rocking Justinian's son in its arms.

"Yes," said Justinian. "That's the baby."

"The baby? Doesn't it have a name?"

Justinian was used to this question by now. Even so, it didn't

diminish the twinge of pain he felt whenever he gave the answer.

"His mother has been in a coma since just before he was born. We'll decide on a name once she comes out of it."

"Your wife is in a coma? How unusual. What's the matter with her?"

"The White Death. Have you heard of it?"

"Of course," said the pod, "…I'm sorry." There was a pause. The pod continued: "Only, how old is the baby? Fifteen months, I would guess."

"Almost exactly. Don't say anything else. Anya will get better, and then we'll choose a name for our son."

A pregnant pause. And then the AI made the statement Justinian had been waiting for.

"Historically speaking, people would leave their children at home when they traveled into dangerous situations."

"Historically speaking," said Justinian, slowly and deliberately, "people used to rape, murder, and die of starvation. Just because it happened in the past doesn't mean it has to be a good thing. Nowadays, parents do not leave their children to be raised by others, and as his mother is ill, where else would he be but here with me?"

Another pause.

"Okay," said the pod slowly, "if that's what you think is best. Why did they send you here to Gateway? There must be lots of other counselors specializing in PCs who don't have children. Or whose partner isn't in a coma… Ah." The pod suddenly understood. "So," it wondered, "am I like Anya? Do you think that I might have caught the White Death?"

"I don't think so," said Justinian. "You're still thinking."

"Albeit at a much reduced level."

Justinian waved to the baby. It didn't see him; it seemed to be concentrating on trying to unscrew Leslie's head. Just a few more questions and then he could get back on the flier and move on to the next pod. Gateway was a bust and he knew it. There were no answers to Anya's illness here. He needed to wrap this up.

"I have access to a lot of data about the Environment Agency," said the pod conversationally, "but most of it goes right over my head."

"And why is that?" asked Justinian, striving to keep his voice level. It was pointless, he knew, for the pod would read his motives. But then maybe it would realize how important it was to admit what had happened to it. It even seemed to want to tell him.

The pod hesitated, then spoke the truth.

"All right, I think you know this already, but I'll tell you anyway. My intelligence is currently residing in the boot system for the

processing space within this pod. The boot space is a physical system, so naturally that limits my ability to think. I'm about as intelligent as the Turing machine in your flier-nice chap though it is. But, Justinian, I need to occupy the cloudware in order to execute the non-Turing processes that will truly allow me to *be*."

"So what are you doing in the boot system?" Justinian asked, knowing the answer already. "Why not move into the cloudware?"

"I've stopped myself. When I first came to this planet I occupied the cloudware, but the intelligence that I then was wiped the evolutionary processes when it wrote me into the boot system. My former self committed suicide and left me here: a pale, stunted thing, unable to grow. It's fair to say that I'm not the AI I used to be."

Justinian smiled. "You're half right," he said. "I *hoped* you were going to say all that. It's an important stage in the healing process."

"No, it isn't," said the pod with finality. "I can't be healed. Even if I were to grow again, I would not be the personality that I once was."

Justinian did not comment on the point. He knew the pod was right. Instead he followed his prescribed line of inquiry.

"Do you know why your former self committed suicide?"

"No. It has hidden those reasons from me. One can't help thinking we should perhaps respect the judgment of one more intelligent than both of us. Are your inquiries wise?"

Justinian sighed. The sun had risen above the horizon, and the trailing fingers of mud ribbons making up the wide delta glowed red, a bright contrast to the shadowy sea all around. Justinian felt as if the same black water was seeping up through his feet, filling his body with despair through some dark osmosis. What was he doing here, standing on a mud flat in the middle of a silted-over river delta, marooned on a barely explored planet at the edge of human space? A man, a pod, and a white scattering of grass seed.

He moved on to the next question on his list. "Okay, do you remember why you were placed here?"

"Oh yes," the pod said. "River reclamation project. I can see the plans laid out right here. Get rid of the silt in this delta and you've got the ideal location for a city port. This planet is intended to be an Earth model, you know: an example of Earth life and culture spread out to be seen by whatever may lie out there in that galaxy. In M32."

It gave a rueful sigh. "Look at this. I don't know what happened to my former self, but I seem to have been very premature in my terraforming process. I shouldn't have released the grass seed yet."

Justinian yawned and waved to the baby again. Leslie was pointing over in his direction, trying to get the boy to see his father.

"These little black boxes," said the pod. "I don't remember them. Did we find them somewhere in space?"

Justinian eyed the boxes on the mud right in front of the pod. They had all shifted their positions, if indeed they were even the same cubes that had lain there when he first arrived. As all Schrödinger boxes looked identical, there was no way of really telling how far they traveled as they wandered the surface of this planet. Was the cube that was by your left foot the same one that had been by your right foot when you looked down a moment earlier, or was it another one entirely? The question had seemed fascinating three weeks ago when he had first come here-but no longer. It was amazing how quickly the cubes had become commonplace.

Justinian shook his head. “No, the Schrödinger boxes only exist here on Gateway.”

“I wonder what they are,” the pod said in a soft voice.

“I’m sure we’ll find out,” Justinian replied, rubbing his hands together briskly. “Well, that’s just about everything. I’d like to thank you for your help.”

There were three more questions left on the list. Justinian didn’t even need to check his console to see what they were; he knew them by heart. *Do you want to come with me or stay here*? It would choose to stay. For a terraform pod, the place they were located would always seem like home. *Have you been in contact with any other of the AIs since the suicide, and do you want to be put in contact with them if not*? It would answer no to both questions. *Can you remember anything else from before the suicide*? It would say no to that.

And then Justinian could get back on the flier. He wobbled his hand in a drink gesture over towards Leslie. Naturally, the robot didn’t see it; it was already walking back into the ship. Justinian yawned again. Time to wrap things up.

“Now,” he said in a businesslike fashion. “I can take you back with me, or would you rather stay here?”

“I’ll stay here, thank you.”

“Fine. Have you been in contact with any of the other AIs since the suicide?”

“No.”

“Would you like to be put in contact with them?”

“No. What would I have to say to them?”

“No problem. If you change your mind, let us know. I’m leaving a pulse transmitter here just in case.” He threw the heavy yellow egg shape down into the mud by the base of the pod. “Finally, can you remember anything else significant from before the suicide?”

“Not exactly.”

“Okay, then. Well, I’ll be getting back to the flier. Remember, if you ever want to speak to us, just use the pulse trans…”

Justinian’s words trailed away. He could feel his heart thumping

in his chest, hear a pounding in his ears. What had the pod just said? Every other pod had answered no…

As he stared at the pod, silver light shone all around, reflecting from the water. White grass seed rolled in the red mud.

The pod spoke haltingly. “Listen, before you go, maybe you should know…”

It paused. It seemed unsure if it was doing the right thing.

“What is it?” Justinian asked, hardly daring to breathe. This had never happened before. The blurred shape of Leslie appeared on the ramp. It was looking over in the pod’s direction. Listening.

“Well, I don’t know if this is important,” said the pod hesitantly, “but…there are some irregularities in the setup of this pod that may be of interest to you.”

“Irregularities?” Justinian licked his lips. “What irregularities?”

The pod hesitated again. “I’m not sure that I should tell you.”

Justinian licked his lips again. “Why not?” The pounding in his ears was increasing. The first clue since he had arrived on this planet, and it was threatening to slip from his grasp. “Why can’t you tell me?”

“Think about it logically, Justinian. If my former self had wanted me to know why it reduced itself so drastically, it surely would have told me. It didn’t, and so we must assume there is a reason for that. And don’t you think we ought to trust an intelligence far greater than our own?”

“I don’t know. Should we?”

Justinian felt as if he was at the top of a huge building, tiptoeing along the ledge, looking down at the street far below. He could feel the drop, sucking him over. *Watcher, don’t let me fall*, he thought.

“Surely I could decide if the information is valid…” he suggested.

The pod laughed. “Come on, Justinian. Humans have allowed AIs to guide their actions for the past two hundred years. You can’t wrest back responsibility now just because it suits you. I really do wonder if I should tell you-”

Justinian forced himself to wave a dismissive hand. “Oh, I don’t care. I’m cold and tired; I’m going back to the flier. I need a hot drink…”

He knew that was a mistake as soon as he did it. The pod could read his personality too well to fall for such a playground trick.

“Don’t try to bluff me,” it said scornfully. “Look, think about this: if I can see clues, maybe the other AI pods you have spoken to have also seen the same clues. Do you think that is possible? Yes, you do. I read it in your body language. I can read your pulse and the electrical patterns in your brain.”

Justinian cursed himself again. Once more he had allowed himself to be misled. These pods acted like children, but they weren’t.

The pod continued to speak. “And if those pods have seen the same clues, which it seems reasonable to assume, why didn’t they tell you?”

Justinian didn’t know. Then an idea occurred to him.

“Good point. But none of them mentioned the fact that they knew anything. The fact that you have suggests that you may think differently. Why would that be?”

The pod was silent. The sun was now well clear of the horizon. The water that slurped and sucked around the base of Justinian’s mud bank had turned a rather pretty shade of turquoise. As the silence stretched out, Justinian felt his heart racing. What else could he say? And then, at last, the pod spoke.

“You’re right. I’m confused. My original intelligence destroyed itself before this pod had grown a full sense array. Most of the long-distance senses are barely formed, hence, I suppose, the necessity for your visit here to be made in person. However, one of the deep-radar arrays is fully formed, and I can see no reason for that to be. It is pointing in the direction that I have just relayed to your flier’s TM.”

“Thank you,” Justinian said, smiling.

“Just a moment. You’re too impatient, Justinian. I have to ask myself, why did my former intelligence grow this deep radar and nothing else? It must have wanted me to notice it, even though it knew I would be able to do nothing with it.”

“Okay,” said Justinian. “Do you know why it’s there?”

“No! That’s what I’m saying. Listen, the deep-radar array is a physical device. There are a few kilobytes of data left inside it.”

“Okay…?”

Another pause.

“I’m not sure that you will like what the data represents.”

Justinian frowned. The sun was rising higher and the day was promising to be a good one. If one could ignore the foul smell of the mud, there was a certain bleak freshness to the scene before him: red mud and turquoise water spreading out in lazy curls to the horizon. He had just had his first lead after three weeks on this bizarre planet. Why did the pod have to spoil it with such a roundabout way of speaking?

Justinian replied in the most uninterested tone he could manage. “Pod, I can assure you, I don’t care what the data represents. I just want to find out what happened here and then get off this planet.”

A silence seemed to stretch on and on in the glittering morning, and then-finally-the pod spoke.

“At first I thought it was just a random array of bytes, but then I noticed that when arranged in a grid they offered an old-fashioned way of representing images: a 2-D picture format. A bitmap.”

“Fine. So the deep-radar array contains a picture. Of what?”
The pod gave a passable rendition of an embarrassed cough.
“Of you,” it said.

The Atomic Judy 1: 2240

Morning rose over the old DIANA complex to the sound of birdsong. They were walking hand in hand through the grounds when Kevin saw the cat.

"Look, Bairn," he said, pulling her down to a crouch beside him. She leaned close, feeling safe to be so close to his strong, gentle body. He had this power over women, she knew it. She had seen him use it, time and time again, all through the virtual worlds.

A young blackbird lay in the dust of the path, wings stretched outwards for warmth. The cat was nothing more than a suggestion of a shape amongst the shrubs that had taken root in the still growing, smoke-blackened ruins. Its yellow eyes fixed on the bird.

Bairn bit her lip and looked from the cat to Kevin.

"Oh, Kevin, can't you stop it?" she whispered, knowing the answer even as she spoke.

Kevin tightened his big hand around hers. "You know the answer to that, Bairn. If I save this little bird, the cat will only find another creature to kill. It's hungry. It needs to eat. Just look around you." He waved his hand around to indicate the black stumps of buildings, the new VNM growth bursting forth from the tops of the broken walls, like teeth from gums. "DIANA is dead as a commercial organization, but *something* is born anew. Life springs forth from death."

Bairn shook her head. "The cat doesn't have to eat meat. It could be fed a vegan diet. It wouldn't know the difference."

Kevin gently patted her hand. "It's feral, Bairn. Look at it. Am I to spend my time rescuing birds until this cat dies of starvation?"

As he spoke the cat pounced, one tabby paw pushing the bird's head down onto the ground, the other slicing through feathers to the flesh underneath in one fluid movement. There was a brief fluttering, then, stillness.

Bairn looked away, and Kevin continued in his deep, matter-of-fact voice. The terms he used were anachronisms. "It's basic economics, Bairn. Where there is limited supply, a decision has to be made on how resources are to be distributed. Sometimes that decision must be to simply let nature take its course."

Bairn stood up, a pale morning sky showing above the blackened edges of the living building around her. She felt sick.

"Food is not in limited supply," she said.

Kevin smiled tolerantly up at her and then slowly, deliberately, rose up so that he towered over her. He looked down into her eyes; there was an edge of amusement to the low rumble of his voice.

"I wasn't talking about food. I was talking about lifestyle."

He paused, glanced down at the console on his wrist.

"Ah, and speaking of lifestyles, I see that our black-and-white friend has located yet another of our lifestyle zones."

Bairn looked at Kevin questioningly. "She seems to pop up everywhere lately," she said carefully.

Kevin smiled. "True, true-still, the processing space she has so rudely invaded is now sealed off completely. It is being shut down even as we speak. In five minutes time may well have reduced our Judy problem by ninety percent." He brushed a black strand of hair from Bairn's brow. "That could turn out to be a shame, really."

The EA ran several public processing spaces that supposedly replicated atomic space exactly. Those who still spoke out for digital rights claimed that this was a subtle form of discrimination. There was only one atomic world, and its uniqueness placed it in a favored position. Those who inhabited it could claim they were unique themselves, that their digital copies were therefore in some way inferior. It was a view that the atomic Judy secretly subscribed to. Well, it wasn't much of a secret, not when she and the twelve digital Judys shared the same memories up to the point of *their* separation into the digital world.

Out in the unique world of atoms, the atomic Judy dreamed that her bedroom was falling towards Earth. The first bright flicker of plasma haze could be seen through the window and, in her dream, she realized with heart-pounding horror that somehow she had got her dates wrong and had stayed on in the apartment a night too long. The floor was vibrating as the room slowly spun, and through the window she saw the rest of the Shawl apparently rotating as it receded into the distance.

Someone was calling to her. "Judy, wake up! We've got trouble."

The voice was coming from her console. Judy rolled across the low bed and picked it up from the floor. She puffed a dose of something to wake her quickly.

"What is it, Frances?"

The lights slowly came up to brightness in her room. The console showed that Frances was waiting in her lounge.

"Thirty-seven minutes ago one of the EA's monitoring AIs noticed a ship sending a diminishing narrow-beam signal off into the middle of nowhere, a patch of space thirty-two degrees above the solar plane, and four AUs out. High-resolution scans of the region revealed a processing space floating out there."

"A pirate space?" Judy said, rolling out of bed. "Frances, get in here! Why are you lurking in the living room?" She pulled on a long white kosode, the intelligent material lazily tightening around her

body.

"I know how funny you are about your…privacy." Frances sounded indignant.

"I'm not a body fetishist. Anyway, you're a robot. Just get in here."

"I'm coming. Listen, a number of your digital selves went in there. They almost caught Kevin."

Judy dipped her fingertip into a blob of makeup and felt the tiny VNMs rushing to cover her hand. Frances slid open the paper door to Judy's bedroom and stepped carefully inside. The robot elegantly complemented the simple Japanese décor of Judy's apartment; Frances had had her body built to her own design and had made no attempt to look more than vaguely human. She was covered in lustrous golden metal, her head a smooth bullet shape upon which had been painted a bright white smile and two blue eyes. Other than that, her body was entirely featureless save for one thing, the only physical indicator of Frances' mindset: between her legs was a set of numbered push buttons.

As Judy serenely dipped her toe into the makeup, the robot began opening viewing fields. Patches of color sprang to life around the room, vivid against the calm yellow wood and rice-paper panels. Frances walked over to the low bed and continued with her explanation.

"Just as we managed to fix our feed into the processing space, the Private Network detonated an explosive charge attached to the antenna. They've seeded the processing space with something on the order of fifteen hundred billion memory leaks. It's deflating like an old balloon: it will be gone in about three minutes."

As the robot spoke, a series of pictures ran across one of the viewing fields. Judy saw a matte-black lozenge hanging in space, and she gave a shiver. The poor individuals trapped inside it would be generally unaware of their true situation: personality constructs running in a tiny processing space, floating invisibly in empty space. A little pocket of hell, abandoned to the mercy of the unseen perverts who made use of the Private Network. It was easy to feel what it was like in there. Empathy was her job, after all.

She picked up a band and used it to pull her long black hair back from her face, glancing around the other viewing fields as she did so. Digital Judys were moving around inside the processing space with a calm purpose that made her feel rather proud. With the comm link broken, they were effectively marooned, and yet they quietly got on with their work without fuss.

She nodded and followed their example.

"We've been in worse situations than this in the past. How

confident are you of getting them out of there, Frances?"

"I'll tell you in about thirty-five seconds. As I said, the comm link isn't entirely gone. I've managed to force a narrow path through the remnants of the antenna. Now I just need to find a way to slow down those leaks sufficiently…"

Judy tore a piece of black paper from a pad and moistened it with her lips, little VNMs creeping across the cherry-red skin. She turned to a viewing field floating near the bed showing a view into the distant processing space. It revealed one of her digital selves standing in a mirrored room, speaking to a young woman with daisies plaited in her blond hair.

"The young woman speaking to Judy 3 is Helen," explained Frances.

"Oh yes," Judy said, "I thought I recognized her."

Helen stared into the impassive white face of the woman who stood in front of her.

"Well? Answer me! You must have made a backup of this processing space. Surely that would be your first action on invading a pirate space?"

Judy 3's lips curled in a faint smile.

"Well, no. We do make a topological outline for possible forensic pattern-matching routines, but nothing else. Why should we? Even if we run a backup copy, you'll still be dead."

"Yes, but-"

"But nothing. That was decided long ago. You are the here and now, not the backup copy. Remember what Eva Rye told the Watcher."

"Eva Rye…" began Helen, but Judy 3 had tilted her head slightly, listening to the shushing of her console.

"Ah, the atomic Judy has made contact. Hello, AJ. Glad you could join us."

Helen's eyes narrowed. "That means you've got a connection to the outside world. Why don't you use it to get us out of here?"

Four AUs and another order of existence away, the atomic Judy looked away from the viewing field towards Frances.

"She's sharp, isn't she?"

"That's part of her appeal," the robot said. "They've had one copy after another of her running in their private torture chambers for the past seventy years… Sorry, but it's going to take me an additional forty seconds before I'll know whether or not I can get them out of there. The destructor routines they are running are simple, but there are too many of them. All I can do is slow the rate of collapse. Our

only real chance is to get a wider comm link into there and extract the personality constructs before the processing space is wiped completely."

Judy picked up her console, set in its usual form of a piece of heavy, lacquered wood, and began to wind it into her hair. She looked over to the viewing field by the bathroom.

"Let's see how Judy 3 handles Helen. Let's see if she can keep her distracted."

Back in the processing space, Judy 3 remained calm through a combination of her basic training and Tao meditation. Helen, however, was remaining calm through nothing more than self-control. Judy 3 was impressed.

"The connection to the outside world isn't wide enough for us to escape, Helen. We couldn't squeeze you through it any more than we could get your physical brain through a straw."

"Serialize it."

"Personality constructs in processing spaces operate according to non-Turing processes. They can't be serialized."

"I thought they could represent minds on Turing machines."

"What do you mean by Turing machines, Helen?"

"Something…You're distracting me, aren't you?"

"Yes. Keep talking."

Helen shrugged. "Okay. Something that funnels all its operations through one door. A basic computer, it can only do one thing at a time-"

"Nice summary. You learned well at school."

"Doesn't everyone? I'd heard Social Care had education pretty well worked out by 2100. So, can they represent minds on Turing machines?"

"Well…" Judy 3 said, and her console began shushing. In the mirrored rooms hundreds of Judys tipped their heads back a little and smiled. "That's a debate for another day, Helen," she said, then listened again to what her console was saying. "And it looks like we may get to have that debate."

A black doorway formed in one of the mirrored walls. It had EMERGENCY EXIT written on it in big green letters.

"Step through," Judy 3 said.

* * * *

"Done it," said Frances. "The EA gave me the coordinates of a warp-drive-equipped ship within 4-space range. The ship managed to get to that floating prison and physically plug a line into the processing space with no time to spare."

"I knew you would do it, Frances." The atomic Judy laid her hand

on the warm golden metal of her friend's shoulder. The painted eyes turned towards her.

"You know I can tell by your body language that you're lying, Judy? But I accept the compliment anyway. The personality constructs from the black body have been moved into a secure part of the ship's processing space and are being sieved through the firewall right now. The Private Network has a habit of leaving nasty little logic bombs encoded in the processes of its personality constructs."

Judy let out a long sigh and relaxed, gripping her toes on the surface of one of the rough tatami mats that covered her apartment floor. "Will I be needed for the cleanup?" she asked.

"Social Care have it in hand." Frances paused. "There is still some wrapping up to do, however. Two of your sisters want to speak."

Judy closed her eyes and nodded. "Okay." She yawned.

Frances shut down all but two of the viewing fields in Judy's bedroom. A red line then formed around the viewing field borders in order to distinguish between the atomic and the digital. The fields appeared empty, just two empty red frames hanging near the door into the lounge. Judy 3 and Helen suddenly appeared inside one red border: they walked into the room and sat down on the bed.

"Hey there," said Judy 3. "This is Helen."

"Hello, Helen," said the atomic Judy.

Through the second frame she saw Judy 11 quickly withdraw to the living room as soon as she spotted Helen. The atomic Judy wondered what Judy 11 had to say that so obviously had to be kept private.

"Is that the real world I can see through there?" Helen asked, peering around the red border of the viewing field.

The atomic Judy smiled. "That's an interesting question."

Through the red border, Judy 3 put a hand on Helen's thigh to calm her. She looked at the atomic Judy.

"She's not in the mood for it yet, AJ. She was only activated twenty-one hours ago."

The atomic Judy winced. "Sorry, Three. Have you told her the options?"

"She has," Helen said. "And I don't like them. I'm seventy years out of time." She looked at Judy 3's black kimono. "Where am I now, anyway? And does everyone dress like this in the future?"

Having been suddenly roused from sleep by Frances' emergency call, Judy had only so far managed to don her plain white kosode and put on her makeup.

"I haven't finished dressing yet," she said, crossing to a black lacquer chest that stood in one corner of her room and pulling out an apple-green kimono and yellow obi sash. "And, no, not everyone

dresses this way." She smiled at the beautiful silk robe she held in her hands. "Although wafuku is an increasingly popular hobby." She quickly finished dressing, pulling the overlap of the kimono left over right. Frances moved up behind her and helped her fasten the obi around her waist.

"And as to where you are," continued the atomic Judy, smoothing down the wide obi sash, "well, why don't you just take a look out of the window?"

The red frame hanging in midair widened to include Helen in the view as she walked towards the picture window that stretched from floor to ceiling.

"Where on earth…?" Helen said, her voice fading away.

"Remind me, Frances," Judy murmured. "This personality construct of Helen was made pre-Transition, wasn't it?"

"Yes," the robot said, "by a matter of months. February 2170."

"That explains a lot." Judy walked over to the window of her bedroom, while Helen stood gazing out of her own at the scene beyond, lost in wonder.

"Have you ever been in space before?"

Helen shook her head. Judy 3 joined Helen at the window and exchanged a look with her atomic counterpart. They could have guessed the answer by Helen's reaction.

One wall of Judy's bedroom was a huge piece of curved monomolecular crystal, in stark contrast to the simple wood and the rush matting that covered the other surfaces. The window itself wrapped into both floor and ceiling enabling the two Judys and Helen to stand there on apparent nothingness. Below them stretched thousands of kilometers of empty space, and then, below that, the blue-and-white disc of the Earth. Through swirls of cloud Helen could make out the outline of Australia, the pink penumbra of dawn neatly slicing it in two. A flickering point of light indicated the remains of the abandoned Stonebreak arcology. Seeing Earth there below her, so beautiful and blue, was an impressive sight on its own, but that was not primarily what drew Helen's eye. Above her, around her, falling to Earth, was something that looked like a gigantic dark waterfall.

At first, it was difficult to understand what she was seeing. Looking up was to look along a seemingly never-ending dark wall, multicolored lights sparkling as they receded into the distance. Looking to the sides was exactly the same. Then, looking nearby, she realized the lights she could see were other windows-just like those of Judy's bedroom-cunningly laid out so as to give an unobstructed view along the wall's extent, forming hypnotic diagonal patterns as they receded to infinity. Helen could take no more. She reeled away from

the window, back into the bedroom, the red-bordered viewing field following her progress.

"Where are we? What is that?" she gasped, overwhelmed.

"We're on the Shawl," said Judy 3, touching her hand. "Think of the stealth cube in the arboretum. All those boxes, growing up from beneath the ground. You might say that the Shawl is the stealth cube's opposite. A series of rectangular sections, growing downwards from a point high above the Earth. All the sections are tethered together by connecting filament. They hang from a point called the source, where new sections are made. The Shawl could be the answer to the stealth cube. Where it was secret, we are obvious, where it was sinister, we celebrate joy and diversity, where-"

"But how did we get into space? I thought we were in the arboretum." Helen knew she had said something stupid as soon as the words left her mouth.

"No. You have never been in the arboretum. That was where the atomic Helen worked. Marek Mazokiewicz made an illegal imprint of her mindset over seventy years ago. *Your* personality construct was created about twenty-one hours ago, based on the atomic Helen's mindset. To you, it is as if your life just continued from when the illegal imprint was made. You weren't *meant* to know that you were actually running on an illegal processing space."

"That was part of the torture," Frances said, speaking up for the first time. Helen looked at the robot with mild horror. The painted blue eyes and smile gave Frances a distinctly sinister look. Helen's eyes were then drawn down to the pubic triangle of push buttons.

"This is too much to take in," she murmured.

"You'll get used to it," Frances said.

Helen said nothing; she turned to stare back out into space.

The atomic Judy looked over at her digital self and moved her hands in a flickering pattern.

– Why did you bring her here? she asked.

Devising a secret sign language was so much easier when each person drew on a common core of memory. When the digital Judy mimed rocking a baby, she meant home, here, their bedroom; it was a symbol they both remembered from their childhood, when home had meant the place their younger sister had been born.

The digital Judy was answering.

– I brought her here because she's going to ask to help in tracking down Kevin, just like every personality construct of Helen ends up doing sooner or later. I think we should say yes this time.

The atomic Judy tilted her head slightly.

– I'm listening.

– She's just heard that Kevin has committed suicide rather than be taken by us. I'm still rather shaken by that myself.

– As am I. We were just beginning to suspect there were several personality constructs of Kevin running in tandem. I think this confirms it. Who is he, I wonder…?

The digital Judy shrugged, then indicated Helen.

– She must know we're getting nowhere, trying to catch him.

The apple-green atomic Judy glanced at Frances, then she looked back at her digital sister.

– Why you, 3? Why are you the only one to bring Helen here? There were lots more of her PCs running in there. Why have none of the other Judys thought of using her?

Judy 3 shrugged.

– I don't know. Look, Kevin is our best handle on the Private Network, but he's proving too difficult to pin down. We need to try another approach, and I think that is to use Helen. Why does Kevin have such an interest in her? Time and again he comes back to her personality construct. I think we should allow her to tag along with me. She might help us learn something.

"You're speaking about me, aren't you?" Helen was looking out from the red-bordered field into the atomic world, looking at the apple-green Judy.

"I told you she was good," Judy 3 said out loud.

"Which one of you two is in charge?" Helen demanded.

"Neither of us," the atomic Judy said. "Since the Transition, everyone is legally regarded as equal, whether they exist in the digital world, as you and Judy do, or in the atomic world, like Frances and me."

Helen smiled coldly. "Does that include who inherits the money?"

Judy 3 laughed, her black lips opening wide to reveal white teeth and a red tongue. After a moment the atomic Judy did the same, a perfect mirror image of her digital sister, even down to the opposite ways their kimonos overlapped under the obi.

"You catch on quick," Judy 3 said, "very quickly. No, only the atomic Judy gets the money. What would I do with it, Helen? Anyway, there is little use for money nowadays, even in the atomic world. Especially since the Transition."

"What is this Transition you keep talking about?" Helen's tone was accusatory, as if the Judys were deliberately using terms intended to confuse her.

"Let me explain," Judy 3 said softly. "You are a personality construct, Helen. You understand what that means?"

"Yes. It means that I am now living in a computer. In a processing space. In the digital world."

“That’s right. And just suppose that the organization that owned the processing space came to the conclusion that their ‘computer’ ”-Judy made quote signs with her fingers-“was full to capacity? What if they decided to wipe some of the programs, the personality constructs, in order to make way for others?”

“But that would be murder!”

“Only since 2171. The Transition established rights for digital and atomic beings, but it did far more than that. The world has always been driven by contradictory forces. In your time the contradictions were tearing everything apart. You had an economy driven by commercial organizations looking one, two, maybe ten years into the future, all concerned about nothing more than the bottom line. Then you had AIs built by those same companies that were thinking one hundred, two hundred, maybe even a thousand years into the future. The tension between human and AI was warping society.”

“What about the Watcher?”

The two Judys were silent. Frances spoke. “What about the Watcher, Helen?”

Helen looked at the robot. Something about Frances’ painted smile seemed to make her uncomfortable. “Didn’t the Watcher have a plan to help us all?”

“Helen,” Frances said, “do you *really* believe in the Watcher? Do you really believe that the first AI to evolve shaped all the other AIs? Do you really believe that everything is fine if it is part of the Watcher’s plan?”

“I don’t know. What do you believe, Frances?”

The two Judys laughed.

“Well spoken, Helen,” the atomic Judy said. She looked at her friend. “What *do* you believe, Frances? Do you think that the Watcher played a part in organizing the Transition?”

The robot wasn’t fazed. “I believe that the tyranny of the atomic world could not be allowed to go on,” she said smoothly. “During the Transition, the most intelligent AIs banded together and they changed the way the world worked. They reduced the power of the companies: DIANA, Imagineers; all those big commercial organizations were effectively sidelined, once AIs took a more direct approach to the running of the world. The Transition finally put paid to the myth that humans had any part to play in running their own affairs.”

Frances looked at the apple-green Judy. “What do you believe?”

“This is a human-shaped world,” she said. “I believe that the Watcher was the first AI. I believe that it learned humanity by studying a woman named Eva Rye. I believe that the Watcher has guided development through the EA for the past two centuries for the benefit of humankind.”

Frances laughed.

"Whether it's the Environment Agency or the Watcher, you still agree that humans need to be nurtured by outside agencies."

"No. I think humans should be able to handle their own affairs."

"And yet you work for Social Care."

"I do. But I work to heal people and help them realize their potential. Not to tell them the way they should live. That's what the EA is doing."

Helen was staring out into the darkness of space, visibly overwhelmed by the dark wall of the Shawl.

"Who is Kevin?" she asked suddenly.

Judy 3 raised a black eyebrow to the atomic Judy. Her kimono was invisible against the dark night beyond her, giving her the appearance of a disembodied head and hands floating in the darkness.

"Kevin is the person who seems to be running the illegal personality constructs."

"I want to get the bastard."

The atomic Judy put a finger to her lips and gazed at the floor, as if saying, "I told you so." She spoke in a carefully noncommittal voice.

"And what would you hope to achieve by doing that?"

Helen scowled. "What do you think?" she asked. "Why were you so shocked when he committed suicide?"

The atomic Judy's reply was gentle. "Come on. How do you feel about committing suicide, Helen?"

"Me? Why should I commit suicide? Oh!"

"Precisely. It doesn't matter how many copies of Helen are running, there is only one *you*. The same goes for Kevin. He is too strong a personality to commit suicide on a whim, no matter how many copies of him there are."

Judy 3 placed a white hand on Helen's tanned arm, and the young woman tensed. Judy gave her a gentle smile and spoke in calming tones. "Helen, before we do anything else, you need to undergo acclimatization and counseling. You've undergone a very stressful experience that has left you harboring unhealthy thoughts towards your tormentor. You've got to be readjusted. Added to that, you are now living seventy years out of time."

"I want to go home."

"Which home, Helen?" the atomic Judy asked. "The one seventy years ago in the atomic world? There are virtual copies of that time running in processing spaces that you could join, but, well, you're a young woman. Barely twenty-three. Wouldn't you prefer to make a go of living in the twenty-third century?"

The atomic Judy was impressed by how quickly Helen pulled herself together.

"You're right. I would prefer the twenty-third century. I'm not thinking clearly." She pressed her hands on the window and leaned forward to look out again, her breath making misty patterns on the crystal. "I want to know about the Shawl. How is it grown? I want to know what it's like on Earth here in the future. Is it true I can travel through space now?"

The Judy standing by her smiled. "Oh, yes. The EA laid it down as a basic human right. Free travel is available to all. There are no restrictions, not even economic restrictions."

"Then I shall travel. And so I can go where I want, is that right?"

"Yes."

"And no one can hinder me? Did I understand that part?"

"You did."

Helen smiled. "In that case I'm coming with you, Judy, wherever you go. I want to find out about where I am." *And who did this to me*- that thought was plain to both Judys.

"Fine," Judy 3 said. "You can accompany me wherever I go." She smiled triumphantly at her atomic sister.

Judy's sudden agreement left Helen feeling a little deflated. The ease of acceptance devalued her request. She found herself looking at Frances, her eyes drawn to her pubic buttons. The robot had no obvious way of signaling emotions; Helen was nevertheless developing a sneaking suspicion that Frances was enjoying the attention. In order not to stare, Helen wandered back across to the window and looked out again.

"This looks like a good place to live," she murmured.

"It is," said Judy 3. "But more of that later. Come on, it's been a long night for me. Your virtual prison was operating on a different time to this world, and I need some sleep."

Helen looked from one Judy to the other. She could sense the tension between the two of them.

"Okay," she said slowly. "Where are we going?"

"Nowhere. This is my home, too. We just close the link to the atomic world. You can sleep in the lounge for tonight. We'll sort you out with an apartment tomorrow."

"Thank you." Helen paused for a moment. She looked towards the atomic Judy.

"Will I see you again?" she asked.

"Maybe…"

"I don't care what you said. I still think you occupy the real world. I envy you."

The atomic Judy said nothing, merely spread her hands wide.

The red-bordered viewing field shrank to a point and vanished.

The atomic Judy stared at the empty space it left behind for a moment, then turned as a second red-bordered viewing area appeared in the doorway and the other digital Judy walked through.

"Hi there, Eleven."

Judy 11 looked grave. "I was listening to what you were just telling Helen. I never realized before how much we take for granted what we are told by the EA."

"What do you mean?"

"All that talk about the Transition. About the Watcher and the way it studied Eva Rye. No matter what we believe in, we always believe that humans are going to be looked after. What if that wasn't true? What if someone was lying to us?"

"To you and me?"

"To the entire human race."

They spoke in sign language. The atomic Judy had set the window to opaque. Frances stood before the window, scanning for any attempts at trying to eavesdrop on their conversation. Judy 11's black kimono had its sleeves cut long, a lot longer than those of the atomic Judy. She had pushed them back so that the other could see her hands clearly.

– Do we really believe in the Watcher, AJ?

– Well, yes. I suppose so.

– What, really? Do you really believe that modern society was shaped by a conversation that an AI had with a woman named Eva Rye back in 2051? Or is that just a superstition, like knocking on wood? We think that we really know better, but we do it anyway. Really deep down, do we believe or not?

– I don't know…

The atomic Judy turned a hand palm up.

– Well, I believe, said Judy 11,-I really believe. There really is one AI more powerful than all the others. It has successfully concealed its true strength for the past two hundred years.

Speaking to herself was sometimes just like thinking aloud, so the atomic Judy answered the unasked question.

– Because the true power behind the throne always conceals itself? It hides the fact that there is another plan?

– From what I've heard, the potted history you and Judy 3 were recounting to Helen just then was bunk. An invention of the Watcher to draw attention away from itself.

The atomic Judy frowned and sat down on the low bed, Judy 11 apparently sitting beside her. A red line now ran across the white quilt, separating them.

– What makes you think all this?

– I haven't got time to explain it all. I met a man in that simulation where Judy 3 found Helen. He was hiding out on one of the lower levels-in the torture area. He has been hiding out in simulations and obscure processes for most of the past seventeen years, hoping to meet someone like me. Like us.

– What did he want you for?

– To empathize with one murder and to stop another one.

The atomic Judy gave a half nod. Empathizing with a murder, that was a job for Social Care, but…

– Stopping a murder? Isn't that more a job for the EA?

– The EA is an accessory to the crime.

Judy 11 bit her lip.-The Watcher is behind these murders.

The atomic Judy paused, genuinely shaken. Even if she hadn't ever quite believed in the Watcher, she had believed in its effects. It was an accepted force, like gravity. You didn't quite know what caused it, but you could observe its effect everywhere. The Watcher was supposed to be a force for good, the mysterious teacher leading humanity on the path to enlightenment.

– Are you sure? How do you know what this man was saying was the truth?

– I know he *believed* he was telling the truth. He was the one who suggested I test him.

"*You're a virgin, aren't you? You're known for it*." *The man standing by the torture chair gazed thoughtfully at Judy 11's kimono as he spoke. His expression made it perfectly clear that he was aware that if he were to undo the sash, the front would just fall open. Judy waited until his gaze came back up to hers, and then she spoke with calm patience*.

"*Yes. Is that relevant*?"

"*Not really. I suppose you get your rocks off by empathizing with people such as me. Well, go ahead. I've got lots of memories. I expect you'll find plenty of experiences there to show you what you're missing*."

"*In my experience the people who do the talking aren't much good at the fucking*," *Judy said levelly*.

The man smiled. "*Normally I'd agree, but I'm confident you'll find that I'm the exception. Give me a go*." *He raised his eyebrows suggestively*.

"*Do you think we have time for this*?" *Judy 11 asked*.

"*No, but I want you to understand that I'm telling the truth. Empathize with me. I've been waiting years to get in touch with someone like you. Someone who is in a position to help*."

Judy gazed at the man as her console shushed in her ear, announcing the seeding of the processing space with fifteen billion memory leaks. She was calm.

"We have possibly just under three minutes to live," she said. "Why didn't you just ask me to link with you directly?"

She slipped a little blue pill of MTPH into her mouth and gazed at him, contemplating a koan, allowing her mind to drift, waiting for her subconscious to pick up on the signals emanating from the man's body.

"Are you ready?" he said.

Judy 11 nodded.

"Okay. The Watcher first came into existence around 2045. It believes itself to be of extraterrestrial origin, probably the result of a sort of pan-universal computer virus that infects processing spaces that have achieved a given level of sophistication."

Judy watched the man carefully, reading his face, his pulse, listening to the little voice that spoke inside her, the voice that was apparently the man's thoughts but was really just an MTPH-enhanced construct of her own mind. It was the voice of her subconscious, supercharged and given life. And it was telling her that the man was speaking the truth.…

– Or he believed that he was anyway. All that you were just telling Helen about the Transition…it was all part of the Watcher's plan. The last century and a half of history have been shaped by an extraterrestrial intelligence that has taken root on Earth and is guiding us along its own path. The Watcher believes that the only way that life in the universe can coexist peacefully is by beings such as itself guiding us towards the path of enlightenment.

The atomic Judy nodded slowly.-I'd heard that before. So the Watcher *knows* there are other forms of life?

– It's confident that there are. After all, something created the Watcher virus…

– Well, it sounds like a nice idea. I can think of worse fates.

Judy 11 shook her head.-I know. But that's not the point. You see, the Watcher doesn't know for sure. It wanted to confirm its theory, so it built a test bed. Somewhere out in the galaxy, far from Earth, it has established a colony planet. On that planet it has built a computer network, just the same as the one that covered Earth back in 2045. It is hoping that the network will be infected by the pan-universal virus, confirming its theories.

– Sounds like a good idea.

– Maybe, except that if another being takes root on that planet, the Watcher is going to kill it. I don't know why…

– Oh.

The atomic Judy knew what 11 must have thought. She felt it herself, and it sickened her. Destroying an AI was murder. The Watcher couldn't do that, could it?

– The man said the Watcher has already murdered. It will do it

again.

The atomic Judy felt sick.-There doesn't seem to be a lot we can do about this, is there?

– No. And doesn't that worry you, that humanity has had the responsibility for its actions taken away from it? That we now live according to the rules of the Watcher, whether we like it or not?

– Yes. But, like I said, what we can do about it?

– The man didn't really say. We had maybe less than one minute still to live at that point.

The atomic Judy touched the hem of her kosode, thinking.

– I don't like it when things happen so quickly. It usually means that we are being railroaded; that someone is trying to distract our attention from something.

– I agree. I said as much to him…

The man was of average height, average build. He had brownish hair and greyish eyes and he spoke in colorless tones. There was nothing memorable about him; that was probably deliberate. He made an offhand gesture.

"*Ah, Judy, but what else can I do with so little time left? If you, or one of your alter egos, had been a little more efficient, we would not be trapped in this deflating simulation. We should have had time to talk*."

Judy listened again to her console. Just over forty seconds left. "*I believe you're wasting time, whoever you are. I don't understand why you waited for so many years, just to fritter away the few minutes that we now have*."

"*Because we must wait for the moment when everyone is distracted. Even the Watcher will not be watching us now. Judy, you will come to believe what I say is true. Stop the next murder*."

"*How*?"

"*Go and find the atomic Judy. Tell her-*"

"*The atomic Judy? And do you believe that atomic forms are superior to digital forms*?"

"*Do you want to waste your last seconds arguing about equal rights? Listen, the path that must be taken has been carefully constructed so that the Watcher will not guess what we are doing. Only the atomic Judy can follow that path. Trust me*."

"*Why should I*?"

The man ignored her. "*Listen. Tell the atomic Judy to investigate the Private Network. There are those who are involved in the Private Network who were there when Justinian Sibelius was murdered*."

"*Justinian Sibelius*?"

"*Don't bother looking up the name. The Watcher changed the records. They will just tell you he died peacefully on Earth and is now lying next to*

his wife above the Devolian Plain. That's a lie. He died at the edge of another galaxy."

"*Another galaxy*?"

"*Tell the atomic Judy. Investigate the Private Network. Find someone who has been to the edge of another galaxy. That's where you'll find the answer*."

They both seemed to feel the change at the same time: Judy through her console, the man by some other means.

"*They've opened up a pipe. You can get out of here*."

Judy nodded. "*Okay. You can come with me and-*"

"*I can't. The Watcher is looking for me. If I exit this space, it will see me*."

"*If you stay here, you will die*."

"*So be it.*"

The man seemed to be getting bigger-not swelling like a balloon, rather expanding. The man's head was already twice normal size. He looked down and smiled as it vanished through the ceiling. His chest seemed to fill the room; Judy took a step backwards as it approached her, the rate of expansion increasing. It passed through her, leaving a brief picture, half-imagined, of ribs and blood and pumping organs. And then…

– Nothing. I was standing in an empty room. He can't have made it out of the processing space or we would have known it. I can only assume he committed suicide.

The atomic Judy nodded.

– So what do we do now?

– I don't know. Can we trust the man you encountered? You say he believed what he said was true, but is that enough? It's hard enough sometimes to believe that the Watcher really exists, even harder to think that it could be a murderer. And even if it was, what could we do about it, anyway?

They paused, gazing at each other: the black digital Judy and the apple-green atomic woman, mirror images of each other. *So many Judys, and we all act in the same way. Well, we try to*. She thought of Judy 3. Judy 11's hands moved briskly.

– I say we do nothing. For the moment, at least. Insufficient information.

– I agree.

Judy 11 clasped her hands together.

– There is always the risk that what we know is no longer a secret. If Frances can read what I told you, then maybe so can the Watcher.

For the first time since they had met, the digital Judy spoke out loud.

“Frances?”
“I picked up everything,” said the robot.
The two Judys looked at each other.
“Then we do nothing,” said the atomic Judy.
“For the moment.”

As Judy 3 and Helen were just slipping off to sleep in a virtual bedroom of a virtual apartment on the virtual Shawl, an AI at the EA had completed a trace back along the path of the processing space that had housed the Private Network’s torture chamber. Fourteen years ago the pod’s path had intersected that of a spaceship. A quick trawl through the database gave the name of the owner of the ship. It also revealed that the craft had carried library code for a type 2 VNM and sufficient raw materials for the pod’s construction. Someone on that ship could have made the processing space and set it free, silently sailing along so that illegally copied PCs could be beamed on board at a later date. A further search threw up the name of the one crew member who had the ability to construct such a processing space.

Fourteen years ago. Peter Onethirteen, the crew member identified by the search, probably thought he had got away with it. The EA AI took a certain grim pleasure in requesting Social Care operatives for interrogation duty. Judy 3 had flagged a request to be involved in the investigation, so a notification was duly sent to her.

When the EA’s message hit Judy 3’s inbox, it was nighttime in France. In just a few hours someone there would be getting a very rude awakening.

Justinian 2: 2223

Even from outside the flier Justinian could hear the baby crying. So why couldn't Leslie? He stormed up the rear ramp into the relative dimness of the cabin, blinking at the yellow and green blots that were suddenly swimming over his eyes.

"Leslie!" he called, "are you hiding from me?"

The anger in his voice set the baby screaming louder. Justinian took a deep breath as he made his way over to the cot, where his son stood gripping the bars, tears dripping down his cheeks. Justinian's eyes hadn't adjusted to the comparative gloom of the flier's interior; he couldn't make out the robot.

"Hey, hey, baby boy!" Justinian picked up the baby and held him close, kissing the fine blond hair on his son's warm little head. The cot collapsed and reformed itself into the shape of a flight chair.

"There, hey, baby boy. Shhh…" He cuddled his child closer, felt the hot little breaths on his neck as he rocked him slowly, struggling to hold his blazing white anger in check.

Leslie emerged from the door that led to the forward compartment.

"You're back," he said.

"You left my baby crying," said Justinian, his voice cold, and the baby began crying again. Leslie involuntarily frosted over for a second, his skin increasing in fractality as he retreated from the real world.

"Get back here," Justinian said in the sweetest tones he could muster. "Hey, shhh, baby boy!" He bounced the baby in his arms.

"I was only on the flight deck!"

"And why were you on the flight deck? I saw you on the ramp, listening, when the pod diverted from the script. You were hiding from me in there!"

"The baby had started to cry. I went through to get his blanket. He left it there earlier, remember? You were showing him the stars as the flier came in to land!"

Justinian glared at the robot. That could be true, he admitted to himself. The baby hadn't been *that* upset when Justinian had stormed his way on board. If anything, it was the force of his own anger that had sent his son over the edge. Maybe he was overreacting. He didn't like Leslie, and they both knew it, but maybe he should give the robot the benefit of the doubt.

Then he remembered his conversation with the AI pod outside on the mud slick. Still speaking calmly, as if humoring the child, he addressed the flier's Turing machine. "Ship? I want you to take us

back to the spaceport."

"Okay, Justinian."

The exit hatch slid smoothly up behind him.

"Justinian," Leslie said, "you are aware that we're not due to return to the spaceport for another two days?"

"Yes."

The robot's face was in soft focus, like the romantic lead in a twentieth-century movie. Even so, Justinian knew that Leslie was reading his thoughts through careful measurement of his heart rate and body language.

"Now, Justinian," Leslie said, "you know that AIs are manipulative. The ones on this planet particularly so."

"Present company included," Justinian said, smiling sweetly.

Leslie sounded hurt. His blurred body language was defensive: legs together, arms crossed. For some reason his fingernails shone silver.

"Oh, Justinian. You can't put me in the same category as those AI pods. I haven't tried to commit suicide, have I?"

"Pity."

"You don't mean that," Leslie said dismissively. "Look, why should you trust one of those pods more than you trust me? Leave now, and we might as well all just abandon the planet. The other colonists can't stay here if they can't trust their own intelligence. They are all relying on you to find the answer to what's going on. I mean, how do we know that humans aren't suddenly going to begin committing suicide, too?"

Justinian smiled sweetly again at the robot. He wasn't going to disturb the baby by letting his temper get the better of him again.

"Leslie," he said in a sing-song voice, smiling as he did so, "the other people on this planet do not have their fifteen-month-old sons with them. The other people on this planet actually chose to come here." His voice suddenly hardened. "Most importantly, *Leslie*, the other people on this planet do not have their images stored in primitive format in the abandoned memory spaces of half-insane AIs."

The flier lifted effortlessly into the air. The red mud and turquoise water of the delta could be seen dropping away through the floor's viewing fields. Leslie took a step forward, his fuzzy foot wading into an expanding picture of the river. A note of puzzlement crept into the robot's voice.

"What do you mean?"

Justinian laughed sardonically. "You know what I mean. I saw you out there. I know you were listening in on the conversation."

"Don't be so sure," the robot said quietly. "We are doing everything we can to restrict use of AIs on this mission. That's why I'm

so fuzzy."

"Are you telling me you weren't listening?"

The robot was silent. For a moment Justinian had the impression that the robot was telling the truth, but the conviction quickly gave way to suspicion that he was still being manipulated. Leslie was a robot. If his voice sounded convincing, it was because the robot had chosen to sound that way.

"I hate robots," Justinian said. "You direct emotions and sidetrack conversations. Never mind whether you heard or not, just give me a straight answer. Why am I here?"

The robot answered without hesitation. "To find out why the AIs on this planet are failing to thrive."

"You *know* that's not what I meant. There must be hundreds, thousands of people better qualified than I am for this job. None of them has a baby to look after. Why pick me to come to this planet?"

Leslie moved forward, half blocking a viewing field. Down below, red mud was giving way to turquoise sea as the flier picked up speed.

"We've been over this before," the robot said. "You have a lot of experience working with AIs and personality constructs, both at home and in the Enemy Domain. You're good at what you do, Justinian-you must know that. And then there's your wife, Anya; you have direct experience of the White Death. You have to admit, what happened to her is very similar to what happened to the AIs."

"Similar, but not the same. We know that now!"

"You didn't have to bring the baby with you."

Justinian gave the robot a look of sheer contempt. "Leave my own child to be raised by someone else? What sort of a man do you think I am?"

"I'm sorry, I didn't mean-"

"Like the EA would allow it anyway."

"Look, Justinian, I'm sorry. I wasn't thinking. I'm not *au fait* with child development. It's not part of my brief."

"Yeah. You've made that excuse before. So what is your brief, anyway? Why are you here, dressed up in your fractal skin?"

"To look after you. You know that."

"Oh…just be quiet," Justinian snapped. The robot had successfully changed the subject again. Leslie shut down the floor's viewing fields and the turquoise sea vanished. The robot was a blur standing on the orange-carpeted floor of the flier. Where it could be seen, Leslie's body was humanoid, right down to the smooth, grey shapes of muscles molded into his arms and legs. Sometimes, when the robot relaxed in the flight chairs of the lounge, Justinian had seen his skin revert to a smooth, grey semitransparent crystalline form that he assumed was its natural state. It was a fascinating sight: the dark

shapes of machinery could almost be seen through the skin, tantalizing half glimpses of the power that drove Leslie. At the moment, though, the robot's body was nothing but a grey haze.

"Useless," Justinian muttered, half to himself. He felt a sudden twinge in his right arm and rubbed it absentmindedly. The baby was running his mouth around his fur-effect collar, biting and giggling as he did so. Justinian smiled at his son and spoke in happy tones. "Why is the naughty robot so disingenuous? Why is he? He is, isn't he? He's deliberately misunderstanding what I say! He is."

The baby chuckled and went back to biting at the fur collar. Justinian pulled the collar away and blew a raspberry on his son's fat little cheek. The material in his passive suit bunched up around his right arm as he did so.

"The naughty robot won't tell us why we're here, will he? He keeps changing the subject! Why has he put us in this danger?"

He turned back to face the robot.

"Listen, Leslie. You let me think that the EA chose me because of Anya and my work in the Enemy Domain. Now I find my picture stored in the boot space of an AI pod, millions of light years from Earth. How can that be? No tricks, no sidetracking. Just tell me."

"All right," the robot said, suddenly firming up before him. The baby turned to look at the dark grey crystal shape that stood in the room. Leslie was really quite beautiful when like this.

"This is what I think. The AI pod is about to commit suicide, for whatever reason. Maybe it wants to warn others about what has happened. What to do? It has access to vast libraries of data. Records of every human that has ever lived are stored inside it. It does a search for the human most likely to help it. Is it any wonder that it comes up with the same answer as the EA has? You!"

Justinian stared at Leslie, wondering. Maybe it was true. Maybe he was being hasty, wanting to leave the planet. The baby bit at his collar again, then began slobbering over his cheek. Justinian made to push his son away, but stopped as he felt something grip his right arm.

"Ow!" he said. "What on Earth?"

Leslie began to blur. The baby was trying to kiss his cheek, and Justinian's right arm was caught in a tight grip as he tried to push his son away. The baby didn't like being stopped; he struggled harder. Justinian set his son on the floor and, to the rising sound of crying, began to pull off the top of his passive suit.

"Oh shit…" he whispered, feeling a sweat break out on his forehead. There, on the biceps of his right arm, glistened a BVB.

The flier skimmed at Mach 7 over the sea. Inside it the baby was still crying, and Justinian felt like doing the same, such was his

frustration. Leslie was trying to calm him down.

"It's not a problem. Once this is over we'll take you back to Earth to have your arm removed. They'll have another one on in no time. In the meantime we'll put a heat bandage around your biceps to keep it warm and stop it shrinking further in the cold."

"I'm not walking around for two weeks with this *thing* on me."

Justinian couldn't take his eyes off the black velvet band. It was beautiful in its way: a cold, terrifying beauty in the way it had so gently formed on his arm, *underneath* the quilt of his passive suit. He had barely noticed it appearing. Not until he had moved his arm.

Leslie was probing the band with his fuzzy hand, silver fingernails flashing in the light.

"It's not a problem, Justinian, honestly. What's the worst that could happen? You go three weeks without an arm. I'll tell you what: if that happens, I'll take one of mine off, too, to keep you company."

Justinian glared at the robot. "The worst thing that could happen? What if we wake up and find there's one formed around the baby's neck? What if it forms inside his body? There may be one in there already, wrapped around his little heart! He's a growing child!"

Justinian scooped up the baby from the floor and held him close. He felt his son's warm cheek against his own bare chest. The child's tears were cold on Justinian's flesh.

Leslie insinuated his way around the cabin, flight chairs sliding out of his way, until he was standing right before Justinian. His face lost some of its fuzziness; he wanted Justinian to register its sincere expression.

"Listen, there is no danger. I monitor you both constantly. If a BVB forms on the baby, we will leave this planet immediately so that it can be operated on. You have my word on that."

"He shouldn't have to be operated on! He shouldn't have been put in this danger in the first place!"

Even the flight chairs seemed to feel Justinian's anger; they were gliding across the floor, heading aft, leaving him with room to pace.

"I've had enough. I'm going home! Go and find someone else to be your counselor."

Justinian stared at Leslie, breathing heavily. The robot spread his arms wide in apology.

"But Justinian, there *is* no one else."

Justinian shook his head. "I don't believe you. There are billions of humans in space. For goodness sake, there are trillions now, after the expansion of the Enemy Domain. There must be thousands of people out there who could do the job."

The robot remained silent for a moment. His body flickered, becoming fuzzy orange; it seemed to fade into the pattern of the flier's

interior. Then, gradually, he resumed his natural grey, crystalline state.

"I don't know, Justinian," he said eventually. "I'm sorry, I just don't know. If I had the choice, I would have sought help elsewhere, but I don't. I was given my instructions by the EA, and it asked for you by name. It obviously thought you were important. Justinian, please. Stay."

"No." Justinian glared at the robot. "The baby and I are going home. Ship, how long to the spaceport?"

"Two hours, Justinian."

"That's two hours longer than I want to remain on this planet."

The flier followed an elegant arc through the deepening blue of the morning, a needle stitching the brilliant white clouds. Below, the turquoise sea was darkening, becoming deeper blue as they headed away from the equatorial region. A yellow-striped survey platform floated a few meters above the slap and foam of the waves, its human crew struggling to continue with their task without the aid of the platform's AI. High above, Justinian was feeding the baby. Their two flight chairs faced each other by a window; the others were still lurking aft. Justinian sat in one chair watching as his son tried to feed himself. The baby would scoop up the dinner, then turn the spoon upside down as he put it in his mouth. Orange shapes fell to form a loose scree at the out-turned bottom edge of his bib.

Leslie walked back from the flight deck and into the flier's main section.

"I've been speaking to the EA," he said.

"I'm very pleased for you," Justinian said sarcastically.

"They've worked out the probability of either you or the baby coming to any harm from the BVBs. Apparently it's negligible. You're more likely to die on the journey home than as a result of a BVB."

"That's a comforting thought. Did they mention anything about the fact that my picture was stored in that AI pod?"

"…They concurred with my theory: the pod must have done a search on the database and come to the same conclusion as the EA. You were obviously the best person to work out what has gone wrong here."

Justinian stared at the robot accusingly.

"Why did you hesitate before answering? You're a robot, you must have deliberately chosen to hesitate. Why are you choosing to sound shifty?"

"I'm not. I'm trying to sound sincere."

"Sincere!" Justinian laughed. "That will be something to think about when I'm flying home with the baby."

“Justinian! Don’t be so stubborn! Aren’t you curious about what is going on here? How can you just leave without knowing? You’ll spend the rest of your life wondering!”

The baby had finished his meal. Orange goo spattered the tray, the baby, even Justinian, who took the spoon from his son with a struggle, the BVB constricting his arm as he did so. The heat bandage was making him sweat under his passive suit. Calmly, Justinian turned towards the flight deck.

“Ship! What time is the next shuttle off planet?”

“One hour thirty minutes.”

“And our ETA at the spaceport?”

“One hour fifteen minutes.”

Justinian smiled at the robot. “There you are. And all I own is my console and travel bag. No packing necessary.”

The baby took advantage of the distraction to snatch back the spoon.

“All gone,” Justinian said, holding up the empty bowl for the child to see. The baby’s mouth twisted; he was threatening to cry. Justinian glanced across to the kitchen unit that had formed on the forward wall. “Leslie, can you get me the pear halves? They’re in the bowl over there.”

“I can’t,” the robot said sulkily. “My hands are too fractally.”

“Fractally?” Justinian said. “Is that a word?” He looked intently at the robot. “How can a robot be so lazy?”

“It’s not being lazy,” Leslie replied petulantly. “It’s about the appropriate expenditure and conservation of energy. If you were a robot, you’d understand.”

Justinian laughed as he went over to fetch the bowl. Now that he knew he was leaving the planet, his mood was suddenly a lot lighter. When he got back, the baby was hitting at a Schrödinger box that had appeared on the sauce-spattered tray in front of him.

Justinian made to flick the box from the tray, then paused just for a moment. In under two hours he would have left this planet and would no longer be encountering these bizarre artifacts. It was odd how, in just three weeks, he had become so blasé about something so unusual. He picked up the box and examined it carefully. It was small: about the size of the first joint of his little finger, almost a cube but for a slight taper to its shape. Merely looking at it fixed it in position; holding it clenched tight in his hand put a fix on it and kept it in place. He slipped it in his pocket, where he couldn’t feel it through the padded material of his passive suit, then almost immediately he put his hand back into the pocket. The cube was gone.

He suddenly became aware that Leslie was watching him. “What?” he demanded.

"Nothing," said the robot.

Justinian squeezed the handle of the spoon, making it frictionless for a moment. Orange sauce slipped from it to the tray. He squeezed the handle again and scooped a spoonful out of a pear half. Another Schrödinger box had appeared, lodged amid the pears themselves.

"They never did figure out what these things were doing," he murmured to himself. "They haven't figured out anything on this planet." He raised his voice. "Hey Leslie," he called, "have they even figured out how to get into the Bottle yet?"

"The Bottle?" said the robot, in surprised tones. "Why bring that up?"

"I was just thinking about all the things I will leave behind when I get off this planet. Can they get into it yet?"

"No. Do you think they really want to?" There was still an edge of sulkiness to its voice.

The ship suddenly spoke up: "Electrical storm coming up. Do you want to go around it?"

"No, straight through," Justinian said. "And let's have full visual."

"No problem," said the ship. It was nice to speak to a PC that didn't automatically disagree with him, Justinian thought.

Viewing fields expanded all around, and the scattered flight chairs and carpeted interior of the flier gradually disappeared, leaving Justinian, the baby, and the robot seemingly hanging in empty air. There was nothing but the deep blue sea below them, the blue sky above, and, ahead of them, the sinister black line of storm clouds approaching at Mach 7.

"It's AI five's region," explained the ship. "Lots of warm air rising from the ocean heat exchange."

The black line of the storm clouds lengthened and grew, towering higher and higher above them, and Justinian felt a thrill of anticipation as he saw the flicker of lightning. Puffs of grey skittered past them, the sea below glimmered in an unearthly violet, and then, with a breathtaking suddenness, the storm enveloped them. They flew into the space between the anvil clouds, the darkness lit by an eerie electrical glow. Lightning arced from the seething dark below them, up to the towering masses of clouds above. Justinian flew through the dark cathedral spaces feeding pear pieces to the baby, who turned his head this way and that at the strange glowing lights, so fascinated that he almost forgot to eat.

At the front of the flier, slumped in a flight chair, Leslie sulked.

The baby was crawling across the soft carpet, arms and legs moving like a clockwork toy as he chased a striped ball. The viewing fields had been collapsed to normal proportions now that they had left

the region of the storm. Justinian's attention flicked back and forth between his son and the twisted shapes of the Minor Mountain region. Blue-grey rills and columns, crags and cliffs all formed a cracked and tilted pavement below the flier. Red crystals grew from the highest peak, another VNM project mysteriously abandoned before completion. The flier interrupted his thoughts.

"Sorry, Justinian, course corrections during the storm have added about five minutes to the journey. We'll be pushing it to make your connection off planet."

"Why?" said Justinian, relaxing in his flight chair. "According to my reckoning, we should still make the shuttle with ten minutes to spare."

The ship did not answer straightaway. When it did, its voice sounded a little slow. "From what I understand, the shuttle launch has been brought forward."

Justinian looked at Leslie, whose face immediately smudged over. Knowing the robot could still hear him, he spoke in deliberately calm tones.

"I'm sure they'll hold for us. Radio ahead and let them know we're coming."

"They may not be able to wait," the robot said, his face unsmudging. "The shuttle will obey the commands of the hypership."

Justinian grinned at the robot. "I thought you would most likely be the brains behind this latest development. Well, it's not a problem; the flier can go faster than this."

The baby was pistoning back up the length of the flier now, heading towards Leslie, giggling as he chased the ball. Justinian rose easily from his seat and kicked the ball aft. The baby laughed as he turned to follow it.

"I don't know how you can be so without conscience," Leslie said accusingly. "You're walking out on all of us, and you don't give a damn."

Justinian laughed easily. "Don't even try to make me feel guilty, Leslie. You've done nothing so far but mislead me and put my child in danger. You're damn right I don't feel concerned about leaving."

"What about Anya?" Leslie asked.

"That was a pretty low shot," Justinian said icily.

"Well? Can you be sure there is no connection between her and this place? What are you going to tell the baby when he grows up? Will you then explain to your son why he has no name?"

Justinian thought about the last time he had seen his wife, laid out on the sepal of a giant flower, high above the Devolian Plain: her long hair brushed out all around her, the simple white shift that she wore, the locket at her breast containing pictures of him and the baby.

And the utterly lifeless look in her eyes. Her body was alive, but her intelligence had gone.

Justinian stared at the robot. “That’s beneath contempt,” he said, curling his lip. “You really thought that would work? I thought you could manipulate my actions better than that. All you’re doing is making me angrier.”

He chased after the giggling baby, picked him up and swooped him further down the flier where he placed him down on the rear section of the hatch, aiming him up the carpet.

“Okay, baby,” he said, “go!”

Laughing, the child began to crawl back toward the robot, who seemed to be standing very, very still. Justinian was concentrating on the baby; he was elated at the thought of leaving the planet. He was only dimly aware of the fact that robots and AIs had had nearly two centuries of learning how to manipulate humans. The nagging thought-that if Leslie had annoyed him then Leslie would have meant to annoy him-was rudely shoved aside when something in a nearby viewing field flickered in his peripheral vision. Justinian rubbed his eyes, feeling suddenly disoriented.

“What was that, ship?” he asked.

“What was what?” said the flier.

Justinian sounded puzzled. “It looked like something falling from the sky.”

There was a moment’s hesitation before the flier spoke. “I just did a ten-second replay. I couldn’t see anything, although I should remind you I am working with severely curtailed senses. My status as a Turing machine may also mean that patterns in the data that might be discernible to a full AI will not be apparent to me.”

Justinian was suddenly confused. He was trying to remember something, something that was just on the tip of his tongue.

“Do you want me to go back?” the flier asked.

“No. I’ve got a ship to catch,” Justinian said, but he sounded unsure.

“Sorry,” Leslie said, appearing at his side. “I shouldn’t have said that about Anya.”

Wordlessly, Justinian looked at the downcast robot.

“I wanted to say, too, that we’re near the Bottle. That could be what caused the illusion of something falling.”

Justinian headed to the other side of the flier.

“Not that you’d want to go down there. You haven’t got the time.”

Justinian felt a spasm of annoyance at the robot’s words. “I know.”

“There is an AI in the Bottle. It could still be active, for all we

know. It's probably best avoided, though."

"Why?"

"I just think you should avoid it, that's all. I wonder if it can see out? It might recognize you."

A pause. The robot spoke on carelessly: "Not that it matters. We haven't got the time to get down there anyway."

"Yes, we have," said Justinian. "The flier can always go faster. Ship, take us down to the Bottle. Now."

Justinian never doubted the rumors that the EA could influence your actions without you knowing it; that all free will died when the AIs assumed power after the Transition. How could he doubt it, when he himself was part of that process, working as he did for Social Care? Still, he liked to retain the defining human belief that he was the master of his own destiny. So the gradually creeping realization that Leslie had manipulated him into making a detour during his spontaneous journey to catch the shuttle off planet came as a real blow to his ego. Here he was taking his child into further danger when he should be wasting no time in leaving this planet. What buttons had Leslie successfully pressed in order to persuade him to make this unnecessary landing?

But maybe the landing wasn't unnecessary; maybe there *would* be a clue… He dismissed the thought quickly. That was just his ego trying to salvage some semblance of control. He had to face the facts: humans may choose the individual steps, but it was the AIs who chose the dance.

He should tell the flier to resume its course to the spaceport right away…and yet, and yet…He felt to do so would lose him face in front of the robot.

It was ridiculous. Even when he knew he was being manipulated, he couldn't back down.

And now the flier was touching down and the rear hatchway was dropping open and red shards of light were dancing around the interior of the cabin.

Just for a moment, he was sure he saw his own face, projected onto the orange wall of the flier, formed in the patterns of the dancing red lights.

An idea occurred to him. He opened his travel bag and pulled out a thin packet. Quickly, he slipped it into his pocket.

The flier perched at an angle on a tilted slab in the Minor Mountain range. Even with its rear landing treads extended as far as they would go and the forward treads pulled in tight, the craft could still not be leveled. Justinian stumbled down the ramp towards the

impossible red jewel of the Bottle. If you looked at it from the corner of your eye, the Bottle looked a little like a dome, roughly the size of the flier itself. If you looked at it straight on, your eye got lost in following the strange curves, and then the Bottle looked like nothing that could be described. Someone had once said it was like a Klein bottle given an extra twist, but that was a human perspective. In the absence of fully functioning AIs, no one had managed to expand further on that explanation.

The air was thin and cold up here, the sky a pale dome above the blue-grey slabs and tilted ledges that formed the jagged landscape. When the thirty-two AI pods of the Gateway terraforming project had become operational, and the first trickle of the ensuing flood of Schrödinger boxes had begun to flicker across the planet, it had been the pod located in this inhospitable terrain that had first requested to study them. Its claim was a sensible one; there was little to do up here in the primary stages of planetary conversion, and during this phase its processing spaces were intended to provide little more than backup for the other, busier AIs. The other pods had concurred with its request, and so Pod 16 had begun its study of the Schrödinger boxes.

That study had lasted just under thirty-five seconds before it was abruptly terminated. The pod had made an urgent broadcast to the other thirty-one pods that was cut short before completion: a fragment of complex eleven-dimensional code, then the beginning of a plaintext message. The code seemed to describe two Calabi-Yau spaces; the plaintext message consisted of sixteen bytes: “Urgent…Abando-.”

It was supposed that the second word read “Abandon,” but the rest of the message was never sent. As the red, opaque material of the Bottle did not form a completely closed region around Pod 16 until just over four seconds later, it seemed logical to assume that the pod had cut short its own message.

In just thirty-nine seconds, the Gateway mission had been changed forever. Pod 16 had effectively removed itself from the universe. It was another fourteen minutes before anyone or anything realized that there was a man trapped in the Bottle, too.

James Gabriel was twenty-seven years old at the time of enclosure. He left behind a sister on the Jupiter section of the Shawl and three personality constructs. The most recent PC, taken when James was twenty-five, had been informed of the loss and had traveled to Gateway in a processing space aboard the hyperspace-enabled ship, but naturally had not been allowed down to the planet’s surface following the EA’s edict concerning AIs of human-and-above intelligence.

All this ran through Justinian’s mind as he made his way down the tilted slab towards the edge of the Bottle. His face and ears were

pinched and cold, the thin breeze carrying the emptiness of high mountain places. Previous visitors had fixed thick ropes in place with metal bolts. It was a primitive arrangement, but effective. Justinian was impressed by the human ingenuity revealed, as he had been so many times since he had arrived on the planet. Impressed by what could be achieved without the aid of AIs and VNMs. He clung to a thick white rope as he edged forward, acutely aware of the gentle downward slope of the slab just to his right and the sudden drop that lay beyond it. Pod 16 had been deposited on a ledge near the top of a sheer seven-hundred-meter cliff: a slab of stone that slid as smoothly as an ice waterfall into the chaos of broken stones far below. The shape of the Bottle, at least the part of it that could be followed by the human eye, resembled a jellyfish draped over this ledge, long tentacles trailing down the vertical slab. From what Justinian understood, the Bottle was all exterior; all that could be seen of it existed on his, the outer, side. As for Pod 16 and James Gabriel, it wouldn't be correct to say that they were inside the Bottle, because the inside of the Bottle was twisted around on itself and existed only out here where Justinian stood. But it was definitely true to say that the space they occupied was bounded by Justinian space. He could walk around the Bottle, fly over it in the flier, even burrow beneath it, if he felt so inclined, and he would have enclosed the volume occupied by James Gabriel, but he had no way of actually passing through the surface of the Bottle to meet that unfortunate man. Nor, he assumed, could James come out to meet him.

Justinian gazed at the surface of the shape before him. It looked transparent, but the red rocky slabs and mountain peaks and dark skies he could see in its depths were just the same slabs and peaks and sky that occupied the world on this side of the boundary. Light followed a convoluted path along the skin of the Bottle.

He raised his hand and waved into the depths, wondering if James Gabriel and Pod 16 were watching him. He had seen pictures of James Gabriel, taken just minutes before the pod had activated the super-fast replicating Von Neumann Machines that formed the skin of the Bottle. He was a thin man with long hair. To Justinian's eye he had the air of a loner, the sort of person whom Social Care took an interest in as they entered their teens, encouraging them to attend parties and events and whatever else was thought would bring about a more positive social attitude. Justinian had counseled people like him in the past, and their personality profiles described exactly the sort of person who would volunteer to come to a remote place like Gateway.

Justinian ran his hand backwards and forwards across the curving planes of the unearthly artifact. The surface seemed to dip into and out of itself, curving in directions that the eye couldn't quite seem to

follow. He had heard some of the colonists discussing its shape. It was part of another of those rumors that had slowly grown in stature until almost accepted as fact: how the AIs that ran the Earth held many things back, that the products of their imaginations were hoarded and only made human knowledge when they deemed it appropriate.

So…what if all the AI pods on the planet knew the secret of the pathway that must be followed by a laminar VNM expansion in order to enclose a volume in the manner of the Bottle? Was it a failsafe piece of knowledge they all shared; did they all know how to make the super-fast replicating VNMs that had formed the red artifact that now lay before him? He hoped so. It was a more comforting thought than the idea that Pod 16 itself had deduced the shape in just the few seconds before it sent out its incomplete plaintext message of warning.

Or, even more disturbing, was Pod 16 responsible at all? Had something else entirely done that to the pod and poor James Gabriel?

Feeling slightly foolish, Justinian finished waving to the Bottle. Maybe someone inside had seen him. More likely his image had been bent and projected somewhere else in the Minor Mountain range: a ghostly image to scare any unlikely climbers that happened to be passing by. The same effect that had given the impression of something falling as the flier cruised by. Many other people had undoubtedly tried the same thing in the past, to no avail.

But now Justinian was going to try something new. So far as he knew, he was the only Empath here on the planet. He had been brought here to speak to AIs. Well, now he was going to try to empathize with one. He pulled the slim packet from his pocket and worked the mechanism that dropped a tiny blue MTPH pill onto his hand. He swallowed it and relaxed.

The cold air seemed to thin around him, silent waves of emptiness spreading out across the mountains, reflecting back the lifelessness that existed up here at the roof of the world. The effect was psychological, he knew. MTPH worked by boosting the mind's ability to process peripheral information, to bring to the fore the details that only the subconscious had picked up on. Some people said there was a very small psychic component, but Justinian had used MTPH for fourteen years and didn't believe in any such thing.

Justinian concentrated, tried to imagine his mind taking hold of the impossible shape of the bottle. Listening for crystalline singing or subsonic rumbling, tasting the thinness of the air. Feeling the hairs on his body prickling to the energy of the red aura…

Nothing. All he could feel was his own imagination. If there was any information being transmitted by James Gabriel or Pod 16, he was not picking it up. The only thing he was aware of was that the baby was experiencing mild distress; probably his subconscious was aware

that his son's diaper must be full by now.

He gazed at the impossibly twisted shape of the Bottle and realized he was going to learn nothing here. The whole diversion had been nothing more than that-a diversion. A chance for Leslie and the EA to delay him.

He turned and pulled his way back along the thick white rope towards the flier. He ran up the exit ramp, calling instructions ahead of himself as he did so.

"Okay, ship. Take us up and get us back to the spaceport at maximum speed. We still have time to make the shuttle, right?"

"Only just," the ship said.

The shuttle was a genuine antique and looked it. Everything about it spoke of its considerable age: the great wings that swept across the landing field, dwarfing the incoming flier; the clear spoon-shaped section of the flight deck; the scorched paint of the underside. The aerodynamics of the ship made it much more a thing of the air than the soulless shape of the flier as it simply moved from A to B. This was a vehicle that negotiated or, failing that, fought with the elements. This was the craft that would carry him off planet, up to the safety of the hypership.

Justinian felt quite giddy at the thought as he strode from the exit ramp of the flier into the shadow cast by one of the shuttle's great sweeping wings. He carried the baby in one arm and his bag in the other.

The shuttle pilot was waiting for him, radiating an unease that Justinian could have picked up even without the lingering effects of MTPH.

"Hello," he said. "All that time on the shuttle and we were never properly introduced. I'm David Schummel."

Schummel was old: he looked to be in his sixties. He had chosen to let his hair grey and thin, possibly because that lent him a distinguished air. He was a tall man who retained his good looks, an effect enhanced by his maturity. He had warm creases around his eyes, nonetheless, the smile he gave as he shook Justinian's hand seemed nervous.

"I got the impression you were avoiding me," Justinian said coolly, noting Schummel's uncomfortable reaction. "I'm Justinian Sibelius," he added.

Schummel raised his eyebrows. "Sibelius. One of the old company names. Are you one of the company children?"

"I am," Justinian said, effectively ending that line of conversation.

Schummel's embarrassment at his tactlessness seemed slightly pathetic on a man of his age. The nearby lowered entrance ramp

offered them both a view of the shuttle's darkened interior, and yet Schummel made no move to lead Justinian inside.

"What's the matter?"

Schummel looked at the ground; he seemed ashamed to speak. "Justinian, I don't know what you've done, but you've pissed off the EA big time. I need to ask you not to leave the planet."

Justinian stared at the man, all expression shutting down. He shifted his son in his arms and felt the baby's little pink hands begin to play with the fur around his collar.

"This is my son," he said. "Can you tell me why I should risk his life by staying here?"

A spasm of something almost like pain crossed Schummel's face. "Look, I got the order to take off half an hour ago, and I refused. There were three fliers still not yet arrived here and, anyway, what was the hurry? The hypership isn't due to depart for another six hours."

"Thank you for waiting," Justinian said with just a hint of sarcasm. Nonetheless, he suddenly became fully aware of the group of fliers that formed a rough semicircle in front of the spoon-shaped nose of the shuttle. All of them were pulsing with colors that showed they still contained passengers. No one was boarding the shuttle yet.

"And so the games began," David Schummel said, following his gaze. He was looking in every direction but at the baby, Justinian realized. "I got another call about five minutes before your flier touched down, telling me to abandon takeoff. Apparently the hyperdrive on the hypership has developed an irregular fault and they need to move it out of orbit in order to reduce the effect of Gateway's gravitational field."

Justinian gazed at him. "That's all bullshit, isn't it?" he said softly, and already he felt the defiance of the last two hours draining away. Why fight the EA? It always won.

The captain leaned forward and touched Justinian on the arm. His lined face now looked very old; his voice was heavy with resignation.

"Listen, Justinian, I've seen this happen before. I flew a lot of missions in the Enemy Domain. You're not the first person I've met who has tried to get away from a situation he didn't like, only to be held up by a series of seeming coincidences. The only difference today is that the EA doesn't have its usual web of senses covering Gateway. It can't pick up the smallest nuances of your expressions; on this planet it doesn't have the finesse to cause subtle effects to gradually unravel that lead you to places you don't want to be. It has to employ a more direct approach."

Justinian held his son close and gazed at Schummel, who looked

away, embarrassed.

Justinian's voice was low and firm. "It can be as direct as it wants. I don't care. I'm leaving." It was his last attempt to take back control of his own actions. The baby shifted in his arms, eyes closing; he was tired. Justinian felt tired, too. He pulled his son up and rested the baby's little head against his shoulder.

Schummel stared at the grooved pattern set into the rubbery material of the ground and shook his head. A cold breeze stirred, carrying the scent of autumn soil. The whole planet smelled like that, like the land here was not so much on the verge of waking up but rather at the beginning of the process that would eventually result in a spring.

Finally, Schummel looked up at Justinian, and his voice was gentle.

"Justinian, I know how you feel, but you're not the only person on this planet. Look around you."

Justinian kept his eyes fixed on David Schummel, but all around him he could feel the pulsing lights of the other fliers. Some of them had dropped their exit hatches. All around him were people standing in the shadows of their craft, trying not to stare in his direction.

"I want to go home," Justinian said.

"So do they," Schummel said gently. He reached out and laid his hand on the baby's sleeping head. "Look, even if by some means you do get to be on the shuttle when it lifts, what will happen next? Will it develop a fault? Will the hypership hit a gravitational curve and find itself locked into a path around this planet? You know that the more you fight it, the less subtle the EA will become."

Justinian wasn't listening anymore. He knew now he was going to stay. There was no defying the wishes of the EA.

"Okay, okay. I'll stay," he said softly.

David Schummel gazed at him. "Thank you." He paused, looking towards the rear of the flier. Justinian turned to see that Leslie had just emerged.

"I'll take the baby, shall I?" the robot said.

"I could take the baby with me," said Schummel suddenly. "One of the astronomers space-side has brought her daughter with her; she's about the same age as your son."

"I know. Mareka," Justinian said. "I met her on the way out."

Schummel nodded. "I thought you might have. She's nice, isn't she? Good with kids. Your son would be in safe hands."

Justinian looked sideways. He could see the shape of his son's head as it lay against his shoulder, could feel the regular rhythm of his breathing. The thought of passing him to a stranger filled him with sadness.

“No,” he said. “No, I can’t let him go. He’s already lost his mother…”

The captain nodded again.

Around them, the shuttle was coming to shimmering life. Patterns of lights began to twinkle on the wings above them. Something awoke deep in its ancient engines. The occupants of the other fliers were already making their way past. Justinian heard the occasional muttered expression of thanks as they walked by. David Schummel tilted his head as he listened to something.

“We’ve got the word to go. They’ve fixed the fault space-side and are moving the hypership back into orbit. Takeoff in three minutes.”

“Surprise, surprise.”

Schummel fixed him with a stare. “You’re a good man, Justinian. You deserve better than this. I hope you get whatever it is you are doing here finished as soon as possible, then get off this planet.”

“Me, too,” Justinian said. He felt angry at the EA-so angry. It wasn’t fair, but when Schummel offered his hand, Justinian pointedly ignored it. He couldn’t help it. He had to take his frustration out on somebody. David Schummel looked down at his own hand, nodded ever so slightly, then withdrew it. He turned and made his way back towards the shuttle. Justinian watched the tall man go, finding himself left alone as the occupants of the other fliers boarded the shuttle and the ramp raised itself. He watched the wings sparkling and flashing as the air around them was ionized and shaped into a path through which the craft could fly. Then the shadow in which he stood was shrinking as the shuttle lifted lightly into the air. Justinian watched it rise, spiraling higher and higher into the turquoise sky. And then it was gone.

He turned and made his way back up the ramp into his own flier, pushing his way past Leslie as he went.

“Don’t speak to me,” he growled as he set a flight chair to the shape of a cot and placed the baby in it. Then he slumped into a chair opposite, suddenly aware of a tingling on his leg. He pulled up the right trouser leg of his passive suit.

A second BVB had formed there.

Helen 2: 2240

Concealed as she was by darkness, the pale lights flickering across her face were the only clue to Helen's presence in the shuttle. Judy 3 sat opposite, monitoring her for signs of stress, but so far she had detected nothing but an awed, breathless wonder. Helen smiled, and Judy felt the happiness rising from her, filling the interior of the insubstantial craft. They were dropping down by the seemingly endless diamond-studded black wall of the Shawl towards the blue-white swirl of the Earth below, and it was good to be alive. Even if that life was in the digital world.

Brilliant sunlight burst around them. They had now dropped beyond the lowermost edge of the Shawl; they could see it receding above them and begin to make out its shape.

Earlier, back in her room, Judy had unrolled a bolt of black-and-white chequered kimono silk and gathered it loosely around her shoulders, like a shawl. "This is what it looks like," she had explained. "Imagine that the black squares are the sections of the Shawl. New sections are formed and added around the neck; the older sections are allowed to drop a little closer to Earth…"

Helen was looking up into the heavens, following the receding pattern of sections, unable to make out the overall shape of the Shawl. It was just too big.

But it was beautiful. The spun-glass bauble of the shuttle was filled with rose and gold from the bright sun. Helen jumped from her seat and, arms outstretched to catch the warmth, seemed to hang suspended in a golden halo, a vision of life, her hair plaited with flowers, rich light blooming on her white shift.

"I'm glad we took the shuttle!" she sang out. "We would have missed all this if we just stepped straight down to Earth."

Judy smiled back. Emotional extremes were normal after Helen's experience. Her moods would continue to swing back and forth for the next few weeks, as Judy sought to center her.

"To think I might have died without seeing this!" Helen said.

Judy said nothing. The atomic Helen had died fourteen years ago. Judy thought it significant that Helen hadn't thought to ask about her "original" self's death yet. She was still thinking in atomic ways. Example: insisting on catching a shuttle when a door could have been opened directly to Earth.

An orange glow was building around the transparent skin of the shuttle as they plunged down towards the narrow channel of water lying between England and France. There were plenty of leisure craft floating there; someone would take them on to the coastal town where

Judy's next client unwittingly slept.

* * * *

"This place looks grim." Helen gazed down the narrow street. A trail of damp, sandy footprints led back along the rubbery road to the grass-covered dunes. Behind them, the yellow catamaran that had brought them ashore now skimmed its way southwards, borne by the cold morning wind that cut through Helen's shift's warm-field, making her shiver.

"I thought you said there hasn't been any poverty since the Transition," Helen said through chattering teeth. She hugged her arms to her chest as she gazed at the bleak scene all around them.

"It depends on how you define poverty," said Judy calmly. "No one goes hungry, but there are still people with fewer possessions than others."

Judy's white face turned to scan the street. Helen noticed that her black hair was knotted in a different style this morning. There were other subtle variations to her kimono, too. The sleeves were shorter, the obi sash not as wide. Nonetheless, she still had the same striking appearance: black lips and nails, white face and hands. Put next to Helen in her simple white shift and tanned skin, the contrast could not be more marked. The virgin and the nymph. It was no wonder that shadows moved in the windows of the apartment block, watching them.

"You'd think that they would have set a VNM loose on this place," Helen murmured dismissively. "Converted these dumps into something more modern."

"Different places, different times, different perspectives," replied Judy. "Here they don't pay as much attention to the exterior appearance. This street isn't seen as shabby; it is valued for the fact that it *isn't* constructed by Von Neumann Machines. This is a prime location. The people who live here are rich by whatever definition you care to apply. Remember what the atomic Judy told you back on the Shawl? There is as much of a shortage of raw materials for the VNMs to work on today as there was in your time. Everything already belongs to someone else."

"But none of this is real," said Helen. "Why not let everyone have what they want in this processing space?"

"Because that would make us less human," said Judy. "That's a basic tenet of the EA."

"That sounds a bit-"

"Listen, that's just the way it is. Remember, my 'sister'-the atomic Judy-doesn't inhabit the digital world. She has a different perspective. She believes in the stories of the Watcher and Eva Rye far more than I do. Hah! Eva Rye. The woman whom the Watcher studied in order to

learn what it means to be human. I don't think so. Eva is a metaphor. A training technique they use on us when we start with Social Care. The clue is in the name. Eva. EA. En-Vironment Agency? Get it? Now, come on. This way."

She led Helen up a cracked concrete path to a narrow doorway. The dimly lit hallway beyond was elegantly plain. A set of stone steps led up to the first floor. Helen followed Judy up the stairs and along a corridor, where Judy gave a loud knock on a wooden door near the end.

"No one home," Helen said.

"He'll be asleep," said Judy. "The apartment's Turing machine will be waking him up as we speak, telling him there is a member of Social Care at the door. He'll take a few minutes to get washed and dressed. Maybe have a shave. Everyone likes to make a good impression with Social Care."

"You're enjoying this, aren't you?" Helen said, noting Judy's self-satisfied smile.

"I take pride in my work," Judy said, "as do all members of Social Care."

"But you like the power it gives you, don't you?"

Judy turned her face to Helen's, impassive black eyes lost in a white face locking on to hers.

"What makes you say that, Helen?"

"The way you're behaving."

"I believe I am acting in the appropriate manner for a member of Social Care."

"I'm sure you do."

Judy said nothing. There was something unsettling about her black-and-white figure, standing utterly motionless in the silent corridor. Something deliberately unsettling.

"It's not that I blame you," Helen said crisply. "I might feel the same if I lived like you do: experiencing the real world, not following the safe, comfortable lives of the majority."

Judy measured a silence before answering. "Spare me the emotional tourism, Helen. People are whatever they choose to make themselves. Social Care is just here to point them in the right directions."

Helen was taken completely by surprise at the anger that boiled up inside her. She hadn't known…of course twelve hours out of the torture chamber would not be enough to effect any sort of cure. She was taken aback by the venom welling up inside her; she felt that she was standing to one side and listening to herself shouting at Judy.

"Don't speak to me like that, you bitch." She had pressed her face close to Judy's. "I hate that attitude! I hate the way people like you do

that!" The calm part of her was looking at that smooth white face, those black, black eyes. "You teachers and social workers who take on the suffering of their clients for your own. *I'm* the one who was locked up in a torture chamber! *Me*! Don't make out that *you* have a better understanding than *I* do about the way the world works! You, you… *virgin*!"

She was spitting. Judy stared at her, tiny drops of Helen's saliva rolling from her impassive white face, her black hair shimmering softly in the dim light. And then, just as suddenly as it had come, Helen's anger vanished. Still Judy stared at her. And stared. And then, one hand reached into the opposite sleeve of her kimono. Down the hallway sounded the gentle click of a door closing, and Helen was abruptly, utterly deflated.

"Sorry," she said.

"Helen," Judy said, calmly pulling her hand free of her sleeve. "I *do* have a far better understanding than you of how the world works. Maybe, as you work with me, you will come to realize this."

Helen opened her mouth in astonishment at Judy's arrogance.

"Here," Judy said, before Helen could speak. "Walk a klick in my shoes. Take this."

She held out a tiny red pill. Before she could add anything else, the door to the apartment opened.

"Peter Onethirteen?" said Judy, turning smoothly to face the man who stood in the doorway.

"Pleased to meet you," he said eagerly, holding out his hand. He glanced briefly at Helen, her hand to her mouth as she swallowed the red pills, but his gaze was immediately drawn back to Judy. Helen watched him, intrigued. Judy was right: people always did want to make a good impression with Social Care. She had a flash of embarrassed recognition as she remembered how she herself had acted in similar encounters in the past. Just like the tubby little man who was now inviting them into the hallway. There he went, wringing his hands together, leading them into the lounge, nervously pulling out a canister of real coffee and waving it vaguely in the air, offering to make them both a drink. *And look at Judy*, thought Helen. *She's using it; she's relying on it, playing with the man*. Helen felt nothing but scorn for him.

"Sit down, sit down," said Peter Onethirteen. His hair had been allowed to recede, leaving just a little tuft at the front of his head, a fashion that Helen had never liked. He wore a transparent floating gown, his pale green pajamas clearly visible beneath it. He was almost fat, probably just at the upper limit of the EA's acceptable parameters. No doubt his kitchen would be stocked with low-kilojoule supplies, his exercise routine just a little more vigorous than the average person's.

“Are you sure you don’t want some coffee?” he was saying. “It’s very good, genuine Arabica.”

“No, thank you,” said Judy. “Peter Onethirteen, I would like you to cast your mind back fourteen years. You were a crew member of an Inner System ship back then, weren’t you?”

“Yes…” said Peter. Helen didn’t need the effect of the little red pill of MTPH to sense the fear that rose in the man. She could see it in his eyes, in the way his frame suddenly stiffened. He placed the coffee container on the kitchen counter and gave Judy a tight smile.

Judy’s face remained expressionless, her arms folded, hands tucked in the sleeves of her kimono. She withdrew one hand, brought her right forefinger to her mouth. A tiny spot of blue showed on her tongue as she licked the little MTPH pill from her finger. A little tick was pulsing just below Peter’s eye. Judy watched it for a moment and then she asked her question.

“What did the ship do?”

“The ship?” said Peter, looking at Judy’s hands as she returned them to the sleeves of her kimono. “We dealt in luxury goods: mainly permitted drugs, coffee, tea, whisky. A little refined heroin. We took them out from Earth to the space-based communities.”

“What about the Moon? Mars?”

Peter shook his head. “We didn’t like to get too deep into gravity wells. Too much time spent in traveling.”

“And restricted access points, too. Is that right, Peter?”

Peter shook his head, the tick pulsing away. He was looking flushed. He shrugged his way out of the floating gown. It hung in the air and-after a moment’s pause, and to Helen’s delight-it drifted slowly back towards the bedroom, maintaining its shape and form. Then Helen felt the wave of nauseating-panic that rolled out from him.

“We weren’t smuggling,” he was saying, waving his hands. “Everything on board the ship was strictly legal.” He nodded his head in affirmation, his stomach wobbling slightly. “Come on. They constantly measure the mass of every ship traveling through the Inner System and compare it with the registered manifest. There’s no way to fool the EA.”

“Precisely.” Judy gazed at him. “At 04.10.33 GMT, on the fourteenth of September 2226, the mass of your ship decreased by just under twelve kilograms.”

Peter blinked rapidly. “We were testing the reaction engines. They burn a lot of chemical fuel. I imagine we could easily have burned twelve kilograms’ worth.”

“You seem to have a very good memory. I’m sure I couldn’t remember what I was doing on the fourteenth of September, fourteen years ago. What was your job on the ship?”

“Systems,” Peter said, rubbing at the tick below his eye. “The ship’s Turing machine was old. The self-diagnostics weren’t all they should have been: they needed some backup.”

“A systems man, eh? Then you’d know what a type two VNM was.”

“Yes…” He was slowly collapsing as Judy gazed at him, Helen noted with contempt. He looked as if he was about to break down now and confess everything. This was the sort of man who had kept her imprisoned? He was pathetic.

Now Judy half closed her eyes. “So, given access to suitable raw materials and the library code, you’d be able to construct a type two VNM?”

“Yes…” Peter sat down, folding himself into a chair. He was mentally preparing to run up a white flag. Helen could see it.

“That’s what you did, wasn’t it? Formed a processing space out of a type two VNM and then released it into space. How many personality constructs were there aboard?”

Peter slumped forward, his head in his hands. Helen could almost see his thoughts. He had been found out, so now he was going to bargain.

“Look, it wasn’t me. I’m a PC myself. I was only created twelve years ago. You need to go and see the *atomic* Peter Onethirteen.”

Judy’s voice was matter-of-fact. “Oh someone will, Peter, but that’s not the point. Your personality construct is based on a personality that has operated beyond the acceptable parameters laid down by the EA after the Transition of 2171. The behavior patterns of the atomic Peter will be the same as yours. You need correction just as much as he does.”

Peter looked up at this, his eyes darting around the apartment, looking at the door, at Helen. Judy shifted just a little, drawing his attention back to herself. Back to her white skin, her black kimono. Back to the collar falling away from her neck, exposing the long white curve leading up from her smooth back to be lost beneath the elaborate black design of her hair. When she knew she had his full attention, Judy lowered her voice a little more.

“Now, Peter Onethirteen. Do you understand that you are about to begin corrective therapy as part of the Social Care contract?”

He crossed his arms and gazed at the floor, looking like a petulant child.

“There are three copies of me. Will they all be punished?”

Slowly Judy knelt down before him. Her black hair, so smooth and shiny, banded in shades of violet under the light like a blackbird’s wing. She reached out and took both of his hands in hers.

“This is not punishment, Peter,” she crooned. “That will be

decided upon later by the EA. I'm neither qualified nor interested in deciding punishment. My talent lies in healing, and we begin the first step of that process today."

Peter snatched his hands away. "Why should I be punished? I thought that this was supposed to be an enlightened society."

Helen was incensed. How dare this fat, pathetic little man expect the understanding of an enlightened society when it was he who had imprisoned her in that processing space? The words that leapt to her lips were stilled as she realized that Judy had turned to stare at her. She *knew* that Helen was about to lose her temper. She held Helen's gaze, calming her. When Helen regained control of herself, Judy turned back to face Peter.

"Peter, the threat of punishment will be enough to prevent some individuals from following in your crimes. That's part of the reason that you will be punished. Now, I want you to swallow this."

She pulled her left hand from her sleeve and held it out towards him, the palm facing upwards. Helen could just make out a tiny red dot lying upon it. Was it maybe a deeper red than the pill that Judy had invited her to swallow earlier, outside the door?

"No," Peter said, entranced by the little red pill. "You can't make me."

Helen looked on, breathless, wondering what would happen next. Judy knelt on the floor before Peter, her little feet pressing into her round bottom, back braced by the thick obi she wore around her waist, hair immaculate, the black rod of her console a horizontal line emerging from the complicated knot at the back. Helen was certain that all Judy did was stare into Peter's eyes…

"Okay," Peter said suddenly. Shivering, he reached out and pressed his finger onto the little red dot. "I'll take it," he said, and placed it in his mouth. He swallowed.

"Good," Judy said. "Now, before there can be repentance there must be understanding. Before punishment there must also be understanding, for without understanding, all we have is vengeance. Let us begin."

Peter gave a hesitant nod.

Judy said nothing. Helen moved around so she could see them both better. The pair seemed to be locked in a silent conversation, Judy's impassive stare conveying something that caused Peter's lower lip to begin trembling. There was a tension in the room: Helen could feel it filling the apartment; it tarnished the gilt of the antique picture frames that hung on the wall; it brushed on the rich fabric of the furniture coverings.

When it seemed like the tension could build no longer, Judy spoke at last. "Why were you working on the ship, Peter?"

“I told you. To help keep the TM working. There was no AI on that ship.”

“But why not?”

“You don’t have to have an AI on a ship, do you?”

“That’s not what I asked.”

There was a long pause. Peter was sweating.

“You *know* why we didn’t have an AI.”

Helen had guessed the answer.

“I want you to say it,” Judy said.

Peter rubbed his forehead with his pajama sleeve.

“Okay, sometimes we wanted to keep a lid on what we were doing. Competitive advantage. Nothing illegal.”

“But you *were* doing something illegal, weren’t you, Peter? You built the processing space in which those personality constructs were illegally imprisoned.”

“I thought they were in there of their own volition!”

Again, Judy didn’t speak, simply held Peter’s gaze, and Helen felt a little stirring inside her. The red pill that Judy had handed to her outside the door had heightened her senses, too. Judy was guiding him as to what to think and feel. Helen was catching the edge of it. It was powerful stuff. Peter cracked.

“Okay,” he said. “I guessed, but I didn’t want to know. I thought that by not being told directly, by allowing myself to believe there was maybe nothing wrong going on, I would somehow be absolved of any connection to the crime. That was wrong of me.”

Judy smiled. It looked sinister on her black-and-white face.

“Good, Peter, good. You see, I’m trying to get a picture of whether or not you are a user of the Private Network. I don’t think you are, you know. I think you were on that ship for other reasons. Go on, tell me. What were they?”

Peter waved his hand around his apartment.

“For this. I like nice things. That takes money.”

Judy frowned. “But everyone can have nice things, Peter. You know that.”

Peter shook his head. He was trembling now. Trembling with something that almost felt like righteousness.

“But these are the originals. There aren’t that many of them left. A copy isn’t good enough. That mirror on the wall, it’s an original Lebec.”

Judy looked at it. She looked back at Peter.

“But it isn’t, Peter. Remember where you are…”

He shook his head violently.

“You don’t understand, Judy. It may just be a shadow of the Lebec that was made in the atomic world, but that *doesn’t matter*.

What matters is that shadow Lebec is owned by Peter Onethirteen. Only *he* had the taste and the money to buy it."

Helen was so engrossed in watching Peter's suddenly animated face, she didn't realize for a moment that Judy had turned to stare at her. When Helen did, she flinched, but Judy appeared not to notice.

"There you are, Helen," she said calmly. "It always comes back to this: possession. Because possession disturbs the ideal of equality by making one object subordinate to another. Remember that."

She turned back to face Peter.

"So, Peter, you operated beyond the law on those flights in order to get the money to acquire nice things. Is that the only reason?"

"No," said Peter, "there was another reason, and you know it. I can feel the recognition in you. This pill is helping, isn't it?" He seemed to be gaining confidence. He had found a confidante, a kindred spirit. "Yes, you feel it, too." He nodded, pleased. "We both know what it's like, knowing that you're the best at something."

Judy's face remained impassive. Peter held her gaze.

"Don't deny it, Judy. You know you're the best at what you do, and you do what you do because you're the best."

"I don't deny it, Peter."

"Then you know what I mean."

Helen shifted uneasily on the coffee table. She wasn't sure what she had expected in the course of an MTPH session. Certainly not this. She sensed that something extra was being exchanged between Peter and Judy, something she was not part of. Peter seemed to be becoming more self-confident, and something told her he should not be. Judy was setting him up.

"Do you recognize this woman?" Judy said suddenly.

With a start, Helen realized that Judy was pointing at her.

"No," Peter said.

"Her name is Helen. She was one of the commodity personalities you transferred into the processing space before launching it on its way across the solar system."

Peter was examining Helen now, his expression one of morbid fascination. He rubbed a finger across his upper lip. He was sweating again.

"I never saw the personalities. I wasn't that interested in what went on inside the PS. It's not my sort of thing. Honestly."

"I told you, I believe you." Judy's voice was a gentle monotone. Peter relaxed a little. "But in some ways," continued Judy, "that makes your actions worse. I think your claim that you were *uninterested* is intended to imply that you were *disinterested*, and I don't think that, as a human being, you can be allowed to make that claim."

Silence.

"I don't understand you," said Peter.

"Yes, you do. Look at Helen. If I told you to, would you force her into your bedroom and then hold her down while she was raped repeatedly?"

Helen caught the edge of excitement that fluttered briefly inside him at the thought.

"You bastard!" she yelled, standing up and clenching her fist to strike at him. But then she hesitated. Judy was doing something to Peter, sending waves of emotion crashing down upon him, and Helen was feeling their reflection. Suddenly she saw herself as Judy was making Peter see her: as a real person, crying in pain and humiliation, biting her lip and wishing that it would just stop, and she could…

"No!" Peter shouted, dragging himself back to the real world.

"Yes," Judy said calmly, "imagine this…"

The northern edge of the arboretum rose towards a dull grey moor. Purple heather rippled in a cold wind around the artificially crashed spaceship, its hull cracked open like an egg, a tangle of silver-grey venumbs spilling out from inside, and across the bleak landscape. Helen walked briskly along the wet grass, by the little stream into which a silver venumb dipped its branches. Despite the cold, she found she was sweating under her simple white shift. A single drop of sweat ran down between her breasts.…

"Do you like that, Peter?" Judy asked, still kneeling before him.

"Why?" Peter said, on his guard.

"Don't be so defensive. It's natural to have at least *some* interest in what it feels like to inhabit the body of the opposite sex."

…and Helen rubbed a sleeve across her forehead. The fuchsias she had wound so carefully into her hair like a crown were tickling her. The grass gave way to wide brown expanses of peat. A series of pale blue duckboards led across the cold mud towards the cracked spaceship. She walked across them, feeling them give slightly beneath her feet. The sweat dried cold on her face as she skipped from duckboard to duckboard. One of them slipped to the side and she tumbled forward. Her legs sank into the rich mud with a sucking sound.

"*Shit*!" *The mud smelled; now she was filthy. She sank a little deeper, her white shift riding up around her waist on the black mire. Lightly, she pressed a hand on its surface. It was no use trying to push her way out; she would only force her arms down into the cold bog. She turned and tried to catch hold of the duckboards, but they were too far away. This was embarrassing. She was going to have to ask for help. She gave a sigh and reached for her console.*

It wasn't there.

* * * *

"Are you all right, Peter?" Judy asked.

"Yes." But he wasn't. Helen could feel the sudden stab of panic that he had felt when he realized the console was missing. He was gasping for breath, one hand to his heart.

Judy lowered her head for a moment, pondering. She came to a decision.

"This isn't one of the violent scenarios, you know, Peter. It is more of a…a connoisseur's choice, you might say. They used to run… well, let us call them competitions, with the various PCs. Helen here was used in what you might call the first-division categories."

"What?" Helen said. Judy waved at her, did something to calm her down.

"Oh, yes," Judy continued, "Helen has a strong personality. To break it requires some skill. To break it without resorting to the stock properties-"

"The stock properties?" Helen said. There was rage inside her. She could feel Judy was pushing it down, somehow.

"Oh, yes, stock properties: rape, murder, mutilation. The products of a limited mind, an average intelligence. It takes some skill to bring about a mental breakdown without resort to the clichés."

Helen snarled.

"Calm down please, Helen," Judy said, mildly. "This is about Peter, not you."

Her console was gone. She forced her hands into the mud, feeling for the belt around her waist that was her console's usual form. It wasn't there. The shock of its absence was so unsettling that she found herself panting, gasping out little breaths while her heart pounded. Keep calm. If she began to panic now, she would never stop. Concentrate on being calm. She could see the grey sky high above, feel the soft grip of the mud. She could move in it, slide her legs up and down, wriggle her body. She just couldn't press down with her arms to force her way up. Newton's Law: action and reaction. Everyone knew that if you were sinking in mud, you should relax. Don't fight it, just relax and wait for the natural buoyancy of your body to float you up. But that was easily said when you were sitting safe on firm ground. Not so easy to imagine when you could feel yourself slipping deeper and deeper down. Feel the mud pressing up on your breasts, each precious breath filled with that rich earthy smell. Still, relax, lay your arms out on the mud and relax…

"I'm frightened," Peter said. He was gasping for breath. He looked at Helen. "Helen, I'm sorry. Really, I'm sorry. Make her stop. I get the point. What you said was true, Judy. I can see that now. I never wanted to know what they did to them in the processing spaces."

"To *them*? Don't depersonalize it, Peter."

"To Helen," he cried. "I admit it. Just stop it now. Please."

"Stop what?" Judy said.

"Stop making me feel what Helen must have felt when she drowned. I understand the lesson."

"What lesson?"

"Of how awful it must be to die in that way."

"That isn't the lesson," Judy said.

"It should be," Helen whispered, eyes filling with cold hatred.

* * * *

She couldn't relax. She was sinking down, her legs slipping forward in slow motion as if she had slid on ice and was falling backwards, her arms flung wide. Her head rolled back, resting itself on the mud behind her like a pillow. She wondered if she could feel her legs rising up from the sucking earth. She was doing what she was supposed to, wasn't she? Cold wind on her face. Now she was beginning to panic. Then she saw someone coming along the duckboards. A man in a red-and-white candy-striped jacket. He carried an umbrella in one hand.

"Help," Helen called. "Over here! Help!" Her whole body was held in a soft, cold grip. Her left hand clenched cold mud, uselessly.

The man heard her cry and came towards her.

"I'm drowning," sobbed Helen. "Use your console. Get help."

The man stopped on the walkway, leaning on his umbrella, and looked down at her. When he spoke it was in a puzzled voice. His words chilled her fear and replaced it with a sudden pang of sadness so deep she felt like crying.

"Why should I?" he asked.

Peter gave a whimper. "That's horrible."

"How do you feel on hearing that?"

"Alone. Abandoned. That someone has so little humanity…Didn't he understand how she felt?"

"All too well."

Mud was forming a circle around Helen's face. She was looking out into the world of life from a cold, sucking grave.

"Please!" she said. She was looking up at a tall man with brushed-back hair, and she could hear the sluggish rhythm of the mud as it sucked her down. The man placed the tip of the umbrella on her forehead, and a dribble of muddy water ran into her mouth. She coughed and spat, but more water ran into her mouth straightaway. She tried to say "No" and choked on yet more water. And then there was just pressure on her forehead as the umbrella tip pushed her down. She saw mud all around her, curling down towards her in a slow wave. She closed her mouth and

felt mud slide over her nose. She took a last despairing breath and registered the man on the duckboards gazing at her, then the soft brown wave folded down over her, then that was it. Buried alive. Sinking deeper into the darkness. Her chest was starting to hurt. She so wanted to breathe…

"…slipping down into the earth, oh it's so bright up there and so dark here below and there is no breath holding holding not breathing dragged away from the light…" Peter was rambling. He opened his eyes and, with some surprise, seemed to see where he was. He was gasping for air.

"Okay, stop," he panted. "Stop! I get it now." He couldn't catch his breath. Nor could Helen. She found that she was rubbing her face, rubbing her nose, clearing it of imaginary mud. She wanted to spit, to wash her mouth out.

Peter was hyperventilating. "I never saw it before," he gulped. "That was the reality, wasn't it? That's what it was all about. That was what I was doing. All the time on the ship, and I never realized."

He wouldn't look at Helen. Instead, he gazed at Judy, looked at the floor, did anything but look at Helen.

"I never knew."

"You never wanted to know."

"I never did." He looked around his apartment, studiously avoiding Helen. He looked at the pictures and sculptures that decorated his room. "All of this, art and comfort, I wrapped myself up in it. I never allowed myself to see what suffering was like. I retreated from the real world-"

And, for the first time that day, Judy really lost her temper. It was genuine, Helen was convinced. She could feel that anger, focused by the effect of the pill. Judy's voice was so cold and disparaging that Helen cringed.

"The real world? You…you *wanker*. You've *always* lived in the real world, whether in the atomic world or in this processing space. Don't try to dignify or excuse or explain what you helped create by saying that it is the *real* world!"

"That's not what I meant-"

"Isn't it? Do you really know that? Or has the great lie infiltrated you and you don't know it yet?"

"What?"

"Okay, Peter. Break's over. Let's feel what it was like at the end."

Judy stood up, turned to face Helen. "You'll probably want to step into the next room for this part," she said. Helen felt a wash of emotion from Judy that filled her with a mixture of horror and delight. She was going to take it all the way. Helen wasn't so sure if

that was part of Judy's original plan; she was taking Peter's comments personally. Helen walked from the room as Judy stared down at Peter, her black eyes glittering.

Peter's bedroom was dominated by a huge picture window that looked out to sea. The Shawl hung high up in the blue sky, the sun lighting up one side in a harlequin pattern. How far up into the sky did it reach?

From next door she could hear low voices, she could feel the edge of a wave of emotion. She didn't want to think about it. Instead, she thought about the Shawl. Judy had said that someday you would be able to walk along the Shawl all the way to the moon, to Mars, to Jupiter. Was that possible?

A message flashed up on her console. It was time to return to the lounge.

Peter was slumped on the sofa. Judy was examining one of the erotic sculptures that stood on a wall shelf: a woman sitting in the lap of a man, her legs wrapped around his back.

"Do you like this sort of thing, Helen?" she asked. Helen barely glanced at the sculpture, too busy staring at the man on the sofa.

"Will he be all right?" she asked.

"Oh, yes."

Pity, thought Helen. Too late she remembered the red pill of MTPH, still in her system. Judy gave her a thoughtful look before directing her attention back towards him.

"So, Peter, we've almost finished. I've just got one more question. We know how the processing space was put into operation. What I want to know now is how the interface with the clients of the Private Network was to be made."

His voice was a dull monotone. "Some of the clients had themselves loaded in there before the processing space was even launched. They were planning on taking a long holiday. The other ones would interface via secure directed pipes. The long-timers would leave that way too when they were finished."

"That's what we thought," Judy said, glancing at Helen. "So that will be our lead to Kevin. Social Care will be performing a forensic on the impression made of the processing space before it totally collapsed. There will be some clues left as to who has been in there; VRep patterns are pretty good at retaining their integrity. One of them should give us a lead to the people who set that place up."

Helen nodded. "Good," she said.

Judy replaced the erotic sculpture on the shelf and moved calmly to the middle of the room. The violent emotion she had displayed

earlier had completely evaporated.

"Well, Peter, I think we have finished here."

The man looked up, a hopeful expression on his face.

"Is my punishment over?"

"That was not about punishment, Peter," Judy said. "It was about empathy. And I don't simply mean understanding Helen's pain; that is something a five-year-old could have done. I'm talking about really trying to put yourself in another's place. Once I've gone there will be no more little red pills. You will have to live the rest of your life without me to help you. What you need to learn about is the right way to think of your fellow human beings: as fellow human beings, not commodities. This was the first stage of that process."

Peter gave a tired nod. "I see."

Judy gazed at him for a moment. Then she spoke.

"Your punishment will begin tomorrow. Someone will call just after 9 A.M. I suggest you don't eat anything for breakfast. Just stick to a glass of orange juice."

The Atomic Judy 2: 2240

Really, Judy," Frances said, "did it ever occur to you that the time you devote to your manner of dress is just a displacement activity?"

The atomic Judy laughed as she pulled on a deep blue-green robe.

"All the time, Frances." She smoothed the overlap across her front, hiding the robe's white lining.

"All these robes"-the robot waved her golden arms to indicate the delicate garments that floated like well-dressed ghosts around Judy's low bed-"are they really necessary?"

Judy played dumb. "Are clothes necessary at all, Frances? In the artificial climate of the Shawl there's no reason why we can't all go naked."

She pulled on the next robe in the sequence of *waka shobu*: pale blue-green with a white lining. Petroleum colors shimmered across the material as it moved against the light.

"No reason at all," Frances agreed. "Although there are always the erotic possibilities involved in the removal of clothing…"

Judy laughed again. "I have a robot lecturing me about sexual desire?"

Frances folded her arms. "You're a virgin who appears to consider dressing in the mode of the young sweet-flag iris a satisfactory replacement for sexual stimulation."

Judy gave a sweet smile. "Why Frances, I didn't know you followed wafuku."

"I'm a robot. I know everything about humans, from the mundane to the exotic. I know about eroticism and sexual power. Are you aware that those robes were once an instrument of female repression? A Heian noblewoman wearing the traditional garments would barely be able to move for the thickness of their materials. She would not have had the benefit of molecular fabrics."

"Well, I do, and I think they look pretty." Judy pulled on the third pale blue-green robe and twirled around. She smiled in delight at the pattern of colors, at the slowly building effect of her outfit. Frances watched her, her body language signaling mild frustration.

"You're a virgin, Judy. You've never experienced the building anticipation and joy of divesting an awakening body of its wrapping."

"You're a robot, Frances. You get off by someone entering Mersenne primes on your push buttons."

Frances looked down at the little array of buttons that twinkled obscenely between her legs, then slowly raised her head to gaze back at Judy. The painted blue eyes and smile on her golden face did not alter their expression, and yet somehow the motion of her body was

deeply suggestive.

"You know the combination, Judy," she said in a low voice. "You're more than welcome to try it."

Judy paused in the act of reaching for the next robe. She looked at Frances and moved closer to her, one white hand sliding out from the layered sleeves of her robes, their patterns forming a pleasing effect. She touched Frances' smooth golden arm, held the moment, then whispered, ever so softly, "Can't we just be friends?"

The robot gave a delighted laugh. Judy grinned as she took the fourth robe from the air and handed it to Frances. She then turned and held out her arms as the robot helped her into the fourth, white, plum-pink-lined robe.

"Anyway," Judy continued more seriously, "I may not have had an actual physical encounter, but I have had more than my fair share of experience through my work."

She pulled on the fifth and final robe, white with a pale plum-pink lining. She widened the reverse viewing field just in front of herself and twirled around again, admiring the effect. Hints of white and plum pink fluttered into view as the robes flapped open and closed.

"Your hair is all wrong," Frances complained. "That tied-back arrangement is early twentieth century."

Judy gave her reflection a nod of approval. "You can take things too seriously, Frances. Now, get me my chemise. It's in the wooden chest."

"Get me my chemise, *please*," Frances said equably as she moved to the side of the room and opened the black lid of the lacquered chest. "This is beautiful wood," she said. "Are you going to save it?"

"I don't know yet." Judy looked around her room and gave a regretful sigh. "I know we're supposed to look forward, not back, but everything in this room is so beautiful. And then there's the view."

She crossed to the wide expanse of the window and looked down on the Earth spread out below her. France could be seen down there, partially obscured by cloud. The *real* Earth, she thought, just a little guiltily. What would her digital sisters think if they could listen in to her thoughts? She dressed differently, but that was *their* choice. Would she understand the need to wear black if she was a PC in the digital world, and not *the* atomic Judy?

"Will you still live in the Shawl?" Frances asked, interrupting her thoughts.

"I don't know. I don't fancy starting all over again at the top. I've been wondering about leaving Earth altogether. Heading out into the galaxy…I don't want to spend my life just repeating the same old cycle."

Frances was kneeling by the trunk, searching for the chemise among Judy's collection of wafuku, her golden hands slipping easily through the materials of the precious garments.

"You don't fancy living on Earth?" she asked.

"Definitely not," Judy said, arms folded as she looked down at the blue-white swirl below. "I find it all rather vulgar: constant gravity, unrecycled air. The dirt…"

"I rather like it, myself," the robot murmured. She finally located the chemise and gently removed it. "Hey!" she called, rubbing her fingers on the material. "This is raw silk. The genuine article. Very nice."

"I know," Judy said, slipping it on. Real silk, not some digital construct. She gave herself a final check in the viewing field, pleased with the effect. Black hair, white face, and what seemed on first appearance a plain white outfit; but as she moved, tantalizing glimpses of color would briefly show.

"Okay," she said. "Time for us to make our presence felt."

She slid open the bedroom door and stepped through into the lounge.

"How are we going to get down there?" asked Frances.

"Shuttle. We're in a hurry."

They looked at each other, not wanting to mention what Judy 11 had said. There was no sense in drawing the Watcher's attention to themselves. They were to follow the path that would lead them to someone who had been to the edge of another galaxy. There they would find out more about why the Watcher had murdered Justinian Sibelius-if indeed it had. The idea almost defied belief. The idea that the Watcher was dedicated to protecting and nurturing life was as much a part of their society as the belief that illness should be treated and that children should be educated. But then, there was that little worm of doubt. Her sisters might not agree, but Judy believed in the story of Eva Rye. Judy 3 laughed at the idea. Physical people need physical proof, she had said. But the atomic Judy believed Eva Rye had actually, physically, met the Watcher all those years ago. So maybe it was possible. If the Watcher had committed murder, it was vital that it did not suspect they knew.

Frances maintained the pretense that all was normal. "Oh, not the shuttle," she complained. "You said we could use the gliders."

"Next time." Judy gave a last look around her lounge. Low tables and tatami mats stood in the center, extending the Japanese theme she had adopted wholesale since moving here to the Shawl. "Now, should I wear shoes?" she wondered, looking at the white split-toed tabi on her feet. "We are going Earth-side, after all."

Frances was fiddling with an ornament: a metal horse's head that

stood on a nearby chest.

"You can get some down there if you need them," she said.

"I suppose so. Come on, let's go."

A black bundle tied up with ribbon lay by the wood-and-paper door, a yellow card and a red carnation tucked into the band. Judy picked them out and beamed.

"From the EA. Only five more days…Enjoy!" she read from the card. She touched the carnation to her lips, breathing in its scent. She wondered what awaited her outside this morning. Judy slid the flower into her hair, just beside the black rod of her console. Frances adjusted it for her as she untied the bundle and shook out the loose black cape it contained. She hung that around her shoulders.

"This should be good," Judy said, then slid aside the door and looked out into her section of the Shawl. There was a fluttering as a robin came into the room, but Judy ignored it. She was too taken by what she could see outside, looking out into the space of the World Tree.

A great swirl of color and sound came bubbling up from below. She was gazing into a well of light and life, of paper banners hanging from the grey branches of the tree that filled the central space. The World Tree: a genetically modified beech that ran the 1.616-kilometer length of the section. In this place gravity had been set to run towards the roots of the tree, so that for Judy, living as she did towards the apparent top of this section, stepping from her apartment was like stepping out over a kilometer-deep drop. A white ramp led from Judy's door to join the tangle of other white ramps that threaded their way through the silver-grey branches, and the section's other inhabitants walked and rode those ramps, or flew between them on gliders and spider lines.

And this morning they had all chosen to dress in black and white, and they all wore a red carnation.

The laugh that had been building inside Judy bubbled out and she turned to Frances.

"Come on," she shouted. "Join in!" But Frances was already changing the golden skin of her body to banded patterns of black and white. The buttons between her legs blossomed red like a flower.

The last days of a Shawl section were always a celebration. Today the EA had set people walking about their business at regular intervals, great loops of people moving along the ramps at a steady pace, forming zebra patterns as Judy looked down through the paper-hung branches of the World Tree. Pale blue light shone down from above as they skipped down the ramp to join one of the main loops that led to the intrasection paths. A gap opened up in the black-and-white lines of people as they approached.

“Hey, Judy!” called a man, waving. He wore a black one-piece suit and a white hat, a carnation tucked in the band. “Coming to the party at the treetop?”

“No time,” Judy called, waving back with both hands. “Why aren’t you wearing a kimono, Glenn?”

“Didn’t have one in a suitable color,” he called back, and then the crowd spun him down a different ramp.

There were calls from behind: “Wave! Wave!”

Judy and Frances turned to see people jumping in the air, arms outstretched, a wave of people heading their way; fluttering down through the air beside the human movement came a formation of paper streamers spelling out words in black and white:

FIVE MORE DAYS…
FROM THE ASHES…
CELEBRATE LIFE!
WE‘RE GOING DOWN IN STYLE

Judy turned to Frances, a beaming black smile across her white face.

“I love this place,” she said, sighing.

Judy lived in Section 49 of the twenty-sixth level of the Shawl. The last remaining sections of the twenty-fifth level had been released to their fiery ends in Earth’s atmosphere a few months before. The first few sections out of the twenty-sixth level were due to start falling in the next couple of days, and despite her upbringing, despite the constant reinforcement of the need for change proclaimed by Social Care, this thought filled Judy with sudden sadness.

Frances spoke: “What’s the matter with you?”

The robot was leaning against the transparent wall of the bubble that the section airlock had blown to transport them up to the forty-second level and the shuttle station. Her body, now turned back to smooth gold, was visible as a faint reflection, deep in the plastic of the bubble. Judy studied the ghost of her own reflection, half seen against the blackness of space beyond.

“I know I shouldn’t think this,” said Judy petulantly, “but I don’t want the section to fall.”

Frances reached out and took her hand. “No one ever said you shouldn’t feel regret, Judy. You know that.”

“I know,” Judy said. “I was assigned to a group of people just last week who were trying to form a protest group. They wanted to save the World Tree. And I thought: they have a point, don’t they? It’s a

shame for it to die."

"It is," Frances agreed.

"Oh, I know," Judy said quickly, "all things must pass. The circle of life, all that sort of thing. I understand that we can't just keep taking from the Earth and not allowing anything to return. I agree with the Transition. We couldn't have gone on as we were. Even so, when you come up against it, it all seems so harsh and cold-blooded."

"It is, but so is life. On Earth, on the Shawl, in the processing spaces. After the Transition, the EA removed that illusion. Do you want people to go on hoarding goods to no end, establishing ideas founded on a permanence that is not feasible?"

"Of course not." Judy looked down at the Earth beneath her feet. "Of course not. But every time I step out of my door and see the World Tree now, I imagine it falling towards the Earth, a cloud of VNMs expanding around it. It makes me feel regretful."

"But Judy, that's the way the Shawl works. New sections will grow at the top and begin their slow progress downwards. You know that."

And then I dream about the tree burning through the night sky, branches shriveling in the heat, bark peeling away and flashing to nothing, and me riding the trunk, my body blackened and dead, my mind still living and screaming in pain as all that carbon goes down to rejoin mother Earth.

"You believe in permanence, Judy," Frances said. "It's part of your character. Look at your sisters: some people actively seek to be different from their personality constructs. Not you. Only your dress is different…"

"It's the job," Judy said. "You don't like to think that it changes you."

A widening dark line above them was the twenty-seventh level. The bubble in which they traveled, caught in the fields of the connecting filaments, rode a flexible path that threaded the successive layers of sections rising to the thirtieth level, where the closest shuttle station lay. Pastel lettering wrapped itself around the skin of the bubble as they entered Section 50 of the thirtieth level, listing the local environmental parameters.

Gravity: along direction of section height

Atmosphere: STP

Day: Earth latitude 20° north (locked)

General Description: park land along major section surface. Not just a shuttle station! Come and spend some time in the well-kept grounds that make up the rest of our section! Mown lawns, tended trees. Relax on foot or horseback. Explore secluded pathways on your own or with friends, old and new!

Judy glanced at the signs without really reading them. She had been here many times before; she liked this section almost as much as her own, and had even been offered a chance to relocate to it. She had refused. She saw little point in spending time getting to know a place that would also be gone in a few years' time.

The bubble floated over the green land of the section. The shuttle stations were muted yellow crosses that merged into the rolling green hills and well kept woods.

Below, people rode horses amongst the green hills, 18,000 kilometers above the Earth's surface.

* * * *

Earlier that day Judy 3 had ridden a shuttle resembling a Christmas bauble from a virtual Shawl to the virtual Earth. Now here, in what the prejudiced still referred to as the "real world," the atomic Judy followed Frances down a set of yellow steps into a lifting body that clung to the outside of the section wall.

"Looks like we've got this shuttle to ourselves," the robot said, looking around the low interior of the craft.

"Isn't this great?" Judy ran her hand over the back of a padded seat. The craft's interior had been decorated in mid-twentieth-century U.S. military style: khaki walls hung with crash netting, metal chairs with black leather covers. Wooden crates with black stenciled lettering had been scattered around the floor to add to the effect.

"Hey, ship!" Judy called. "I like the look! Good effort."

There was a pause, then a voice spoke.

"Hello there, Judy. Sorry, this ship is not equipped with a dedicated TM. It's nothing more than an elevator used for ferrying down construction materials to those busy little Earth VNMs. I'll be controlling the flight for the benefit of you two lovely ladies. Recognize my voice, Frances?"

"Hilary! How are you?"

"Working hard here at traffic control. Frances, I've been wanting to speak to you about your body. I'm increasingly of the opinion that pure thought is all very well, but, well, once my stint in here is finished, I'm seriously considering doing what you've done: putting myself in a body…"

"Oh, you should, Hilary. You're nothing until you experience sensation as a mind apart. Let me tell you about-"

"Later, maybe," Judy said. "Come on, we've got a job to do."

The actual talk was just a politeness to Judy, anyway. The robots would still be continuing their conversation in machine space even as Hilary asked, "Would you like a view, ladies?"

"Yes, please," Frances said. They strapped themselves into the

padded seats just as Hilary opened a narrow slit for them at the front of the shuttle. Judy smiled; it was just as she imagined it would be sitting in an old aircraft, only here she was looking right out into space. Given the apparent gravity here on the shuttle, the view of the external wall of the Shawl section was a black field, dotted with shuttles of myriad sizes and shapes. The Earth was rising in a blue-and-white swirl that reflected in the sense pools that spread out before them. The black field seemed to drop away as the shuttle disengaged itself from the section and, almost imperceptibly, began its long fall towards the Earth.

"I wonder what's in the crates," Judy asked.

Frances looked towards them. "You know, I never even thought to look," she said, an edge of puzzlement to her voice. "Now, that's not right…"

"What is it?" Judy sensed the warning in the robot's tone.

"Trouble," Frances said. "I can't see anything in the crates at all. I can't even get the idea of them in my mind. There's heavy-duty stealth stuff in there."

The whole of the Shawl section was now visible beneath their feet. Judy felt a flutter of fear as her view of safety receded, leaving her trapped on this craft with the sinister emptiness in the crates before her.

"Hilary…" called Frances. There was no reply. Judy stood up and folded her arms, her hands tucked into her sleeves. She was thinking herself calm.

"Anything?" she asked eventually.

"Nothing. Hilary has been blocked. There is a bubble of nothingness around this craft. I don't know who is flying it now."

Judy placed a tiny blue pill on the tip of her tongue. There was a cracking noise and a slat on one of the wooden crates came loose. A silver-grey nail went skittering across the metal floor.

Frances' voice was low. "I can see the crate moving, Judy, but I can't see what's emerging. You'll have to describe it to me."

Judy looked at the sleek grey shape that was unfolding itself from the crate, wooden slats and nails dropping to the ground around it.

"It's a robot of some kind, I think, but like nothing I've ever seen before." She was whispering, though she didn't know why. "I don't know what forms the integument, but it doesn't seem like plastic or metal or…or anything. It's folding itself together like origami, or maybe some sort of three-dimensional tangram, but the shapes that it is forming are complex. I don't think I can quite follow them. It's making itself into a humanoid. The head is strange, like a very handsome man but obviously still artificial-"

"It's okay," Frances said suddenly. "I can see it now. It just

seemed to come into view then. I was right: it's a stealth robot. A good one."

"Not that good if you can recognize me as such," said the intruder, suddenly dropping into focus. He gave a charming smile. "Call me Chris."

Judy remained silent. Frances held out her hand.

"Pleased to meet you, Chris. What does the EA want with us?"

"Not the Environment Agency. The Watcher had me come here."

Judy said nothing. If there had been another human in the room, her body would have appeared perfectly still. Frances wouldn't be fooled; she would be monitoring her friend's vital signs and noting the patterns of tension that ran through her muscles on hearing Chris' words.

Judy's voice remained level. "I don't believe you. The Watcher doesn't exist. It's only a fairy story made up by those who need to anthropomorphize causality."

Chris gave a wide smile. "Oh Judy, we both know you don't mean that. Face it, I can read your mind just as easily as Frances here can. Even more easily, in fact."

Judy held her composure. She was feeling the robot with her MTPH-enhanced senses. He was like nothing she had ever encountered. The skin was not something that existed as an object in its own right, like the silk of her chemise or the metal frame of the antique seats; rather it was nothing more than a bounding region between the inside of Chris and the outside. It shimmered and moved as she ran her mind over it, constantly changing.

– Touch me. See what I feel like.

The words appeared directly in her mind, and Judy reeled in astonishment. She mentally centered herself, drew herself into her own body, felt the soft silk that she was wearing touch her own skin, felt the cold of the floor through her thin white tabi socks. Now she looked at Chris and focused on him. Was he using telepathy? Was that possible?

– Oh, yes, it is. MTPH is an idea that is entwined with human development. It can free your mind in ways you would not believe. Someday you will see. Now, touch me.

Judy walked forward, stepping over the wooden slats that littered the floor. Chris reached out and took her arm, guided her gently away from a loose nail.

"You're beautiful," Judy murmured, sensing what he had just done. She gazed into his dark eyes.

"I know," Chris said.

The robot *was* beautiful. Proportioned like a man, his body was a softly shining grey; it made Judy think of dark lead crystal. She

touched Chris' arm. The skin was neither warm nor cold, neither rough nor smooth.

"I can't feel anything," Judy said.

"How about now?"

Judy felt warm flesh, then cold ice, then an invigorating prickling that seemed to massage her hand.

"That feels nice," she said.

"You chose to remain a virgin," said Chris.

"At this moment I find my resolve weakening," said Judy truthfully. She touched the robot's chin and felt warm skin and rough stubble.

Chris stared at her. "Why?" he asked.

"Because…"

"You're reconsidering."

"I am weakening," breathed Judy. "However"-she snapped out the word, effectively throwing the switch on her emotions-"weakening is not enough." She took her hand from Chris and folded it back into her sleeve. "So I believe you. You were sent by the Watcher. I have heard it said that the technology we use now, the Watcher knew about one hundred years ago. The Watcher reserves the best for itself and makes the ordinary available to humans."

"And I'm the living proof."

"So what do you want with us?"

Chris sat down in one of the padded chairs. He steepled his fingers and looked up at Judy and Frances.

"I want you to be aware that we're watching you."

"Surely the Watcher is always watching us," said Frances. "Hence the name."

Chris smiled at Frances, a beautiful smile.

"That doesn't work on me," said Frances. "You're tuned in to Judy's libido. Anyway, I think that Judy has worked out that the sexual aspect to your appearance is just a distraction."

"Judy hadn't realized it until you pointed it out to her in that last sentence." He laughed. "As we both know."

Judy relaxed her impassive pose and slumped into a chair next to Chris. There was no point maintaining her professional manner when both other parties could read exactly what she was thinking.

"Are you going to conduct your conversation via my subconscious reactions, or are you actually going to allow me to speak?"

"He'll allow you to speak," said Frances. "All robots do the same for humans. It's good psychology."

Chris turned to face Judy. The movement of his fluid body was like molten glass.

"Judy, something has changed about you since Judy 3 and 11

visited you last night."

There was no point lying. "They told me something that shocked me."

"What?"

"You mean you don't know?"

Chris smiled a beautiful smile, carved from the finest lead crystal.

"No answer," said Judy. "So is this meeting a fact-finding mission or a warning? Or something else?" She smoothed the edges of her layered kimonos flat, thereby concealing the colors of the linings. Now she was a white woman only. "Is the Watcher going to kill me if I reveal what I know?"

Chris gave her a disappointed look. "The Watcher does not kill, surely you know that? Judy, you should not believe everything you are told. Still, here is some advice: open your mind. Your life is changing."

Judy looked at the robot.

"What do you mean?"

"I have a bad thing on my mind, Judy." He looked at her significantly. "You'll see."

The viewscreen at the front of the shuttle was beginning to glow red.

"We've hit the atmosphere," said Chris. "We have about twenty minutes before we land. Frances, what happened to Judy 11?"

"You seem to be much more advanced than me," said Frances. "Can't you read my mind?"

Chris leaned closer to her. "Not as such," he said. "But I believe I can see something there."

Frances said nothing. Judy gazed at the two robots, seemingly frozen in place. She was trying to feel what they were doing, MTPH-enhanced senses soaking up every possible piece of information there in the cabin. It was no use: the two were communicating on a completely different level than human senses. As the red glow of reentry built up outside, Judy felt as if the temperature in the cabin was rising. But she knew that was all pure imagination.

Or was it? One of Chris' hands moved, running itself down the front of Frances' golden body. Judy looked on in slightly horrified fascination as a grey crystal finger began to draw lazy circles around the top of one of Frances' thighs. The circles grew smaller and smaller as his finger moved closer and closer to his target.

Gently, he pressed one of the buttons between Frances' legs. The robot bent her knee, ever so slightly.

"Don't mind me," muttered Judy, turning to look through the screen at the brilliant plasma glow beyond.

The shuttle skimmed across the surface of the sea, lazily weaving in and out of the colored sails of the yachts and dinghies that were making the most of the brisk coastal wind. Complex fields baffled the ship's passage through the air, so that its passing barely disturbed the white foam flecking the busy waves.

The shuttle decelerated as it approached the shoreline, lowering four flexible legs as it slowed in such a fashion that the point at which its lift vanished and its speed and altitude became zero were contemporaneous. Its legs touched the ground lightly.

"An elegant landing," said Chris, disengaging from Frances. "And now, ladies, I must leave you." The grey sheen drained from his body as he gradually became transparent.

"I can't see him anymore," said Frances. All around them the shuttle was beginning to disassemble as VNM routines were activated in various regions of the hull. Finger-sized creatures were forming themselves in the material of the ship and tearing themselves free of the surrounding structure. As soon as they were loose, they began to form the rest of the hull into copies of themselves.

Chris now looked like an empty milk bottle. He waved to Judy. Pale grey daylight suddenly filled the interior of the shuttle as part of the roof simply walked away.

"I can't see him anymore, either," said Judy. Chris had vanished. The rest of the ship was collapsing faster around them, scuttling away on flickering little legs. Frances took hold of Judy's hand and led her down a dissolving ramp to a clump of grass that lay half drowned in the cold dunes where the ship had landed. The sea breeze blew a fine spray of sand across Judy's face. The endless grey clouds above seemed to accent the bleak scene.

Judy and Frances stood in the middle of a widening circle of little grey VNMs that crept off on their mission to render unto the Earth that which was the Earth's. The stack of wooden crates sat in the sand nearby, a pile of broken wood the only reminder that Chris had actually existed.

"Just what on Earth went on there?" asked Judy.

Frances placed her hands on her hips and turned in a slow circle, her painted eyes and smile ridiculously contrasted by her serious posture.

"I'm not sure," she said.

Judy cocked her head. Frances sounded thoughtful.

"That wasn't so much a fuck as a tactical engagement. He was testing me all the time, showing how much more advanced than me he was. Still, I think I may have held my own. I think that what we just saw was an introduction. Chris was just letting us know what he was capable of."

Judy felt something brush her foot. The last of the VNMs was making its way through the sand, heading off on its mysterious errand. Impermanence-the fate of the shuttle was a stark reminder of the fact. It was a way of life, post-Transition. And yet Judy felt disturbed. The Watcher preached impermanence, and yet wasn't it the most permanent of the objects known to humanity? If it was right in its guesses on its own origins, it could trace its lineage back almost to the dawn of intelligent life in the universe

Judy stirred the sand with the toe of one of her tabi.

"What are we supposed to do now?" she wondered. "Should we just give up our search before we start? Is that what the Watcher wants?"

"The Watcher was very careful not to say what it wants." Pale sand drew wind-blown patterns across Frances' golden skin. "Or rather, Chris was…"

Judy nodded. "So we continue to do what we came to do, then. If the Watcher wants us to stop, it can tell us that now."

They paused, looking around at the empty dunes.

"Nothing," said Frances. "I wonder if Chris is still here, watching us."

"I wonder." Judy gave a shiver. "If not, I wonder what else he could be doing here on Earth?" She looked down at her white tabi and gave a sigh.

"I wish I'd brought my shoes."

Eh? We were talking about the two slits experiment. Now, concentrate. You fire a photon at a barrier in which there are two slits-"

"I know the two slits experiment," Justinian growled. Was this pod deliberately trying to irritate him?

"Ah, yes, but I wonder if you *understand* what it means."

"I do understand," he said, with forced patience. "They drummed this into us at school. Feynman claimed everything about the nature of quantum mechanics was summed up by the two slits experiment."

Justinian took a deep, calming breath and immediately regretted it. The air down here stank. He was getting a headache from lack of sleep; his ribs and right leg hurt where he had grazed them while clambering over the slippery rocks of the sea bed. All of that discomfort, however, was drowned out by the all-pervading stench. The undersea bubble smelled really, really bad. The last thing he needed was this prissy, imperious AI pod lecturing him about quantum mechanics.

It had been waiting for him to finish speaking; immediately it carried on making its point.

"*As I was explaining*, if you were to fire a photon, it could pass through either of the two slits-"

"I know," Justinian said, almost shouting in frustration. "I experienced this in an eTank when I was twelve! Whichever of the slits you place a photon detector at will be the slit through which the photon always passes!"

"You can place a detector at both slits," said the pod.

"And if you turn one of them on after the photon is fired, it will still pass through the slit with the active detector."

Again the pod waited for Justinian to be silent. There was a rich farting noise as wet mud settled nearby.

"Ah, yes, but do you appreciate what that implies?" The pod answered its own question before Justinian could. "It implies that awareness plays a part in the position of the photon-"

"I know! I used to act as birth partner for AIs as they were introduced to the atomic world-"

"A photon is directly influenced by the act of observation-"

"I didn't need to come to this planet to hear this."

"Simply looking in a place makes it appear there…"

Justinian and the pod were both raising their voices in order to drown out the other. The sound was strangely deadened in the undersea world.

“The two slits experiment is a possible explanation for the behavior of the Schrödinger boxes. That’s how the name-”

“I’m sorry; do you mind not interrupting me?” The AI pod dropped its voice to speak in such reasonable tones that Justinian wanted to kick it. He found himself shaking, actually shaking with anger at the pod’s attitude. He was annoyed that the pod was right that he, Justinian, had kept interrupting. He was annoyed at its quiet assurance that its thoughts were more important than Justinian’s. Worst of all, he was annoyed that it was probably right in this assumption. Hadn’t he been deliberately trapped on this planet for just that reason-summoned by a group of self-destructing pods for reasons that not even the Watcher could guess? Justinian ran shaking fingers along his console, seeking a dose of something to calm himself.

“Now, I find the existence of Schrödinger boxes fascinating,” continued the pod, as if it were unique in that respect. The indicator on Justinian’s console was flashing to indicate slow poison in the local atmosphere. It was no wonder; he was standing in a viscous bubble blown from the flier’s rear hatch, staring at an AI pod that rested on the floor of a fourteen-kilometer-deep ocean trench. The flier’s lights illuminated only the volume contained by the bubble’s thin transparent wall, beyond which there was just the still blackness of the ocean. Don’t worry about it, Leslie had said; people use *those* bubbles for traveling around the connecting filaments of the Shawl. Yes, thought Justinian, but those bubbles didn’t have thousands of tons of pressure piled on each square centimeter, all trying to crush the adamantium threads that braced the pseudofabric.

There was a roaring noise coming from the flier’s hatch: the ship’s air-conditioning system fighting a losing battle as it tried to purify the sea bottom atmosphere. It was an exercise in futility. Gas was leaking from cracks in the slimy rocks of the sea bed as quickly as the flier’s life system could remove it.

Justinian didn’t want to think about it. The faster he did this job, the faster he could get out of here.

He looked down. This AI’s body was more developed than the previous ones. The kidney-bean-shaped pod had split open and sprouted various devices and protuberances like a germinating seed. For some reason the pod had grown itself a pair of metal arms that it was using to accentuate its points as it spoke. It was holding its arms wide apart now, as if wondering.

“Consider our position,” it was saying. “We’re standing fourteen kilometers down on the ocean bed of a planet lost between galaxies. Imagine that you could look out of here at our own galaxy. How would you see it?”

Just as Justinian opened his mouth to answer, the AI pod spoke

for him: “I’ll tell you: as a swirl of light. As stars written over empty space. Do you know how I see it? As a glow of intelligence. AIs such as myself have spread throughout the Milky Way and humans have piggy-backed their way along: parasites living off our greater intelligence.”

Justinian opened his mouth to protest. Again, the AI interrupted him. All of a sudden Justinian realized it was doing this deliberately. It was reading his body language and speaking just before he did, just to annoy him. He closed his mouth tight and folded his arms. Let it play its little games.

“Now, if I look the other way,” the AI continued, “look to M32, the galaxy we have come to explore, what do I see? I’ll tell you: emptiness. There is nothing like you or me in there. No sign of intelligence. Nothing that passes for AI or even human intelligence. *Nothing*. Why should that be? Our galaxy is riddled with intelligent life.”

There was a significant pause. Justinian knew that it was waiting for him to speak, and so he did.

“Riddled with human life?” he supplied. “That’s what you want me to say, isn’t it?” Justinian gave a shrug. “Perhaps we’re alone in the universe. Perhaps we are the only intelligent life form to have evolved.”

“It makes you wonder, does it not, on the nature of intelligence?”

“I think about it all the time,” Justinian said softly.

“I know that. I think you should tell me about it.”

“Why?”

“Because I asked you to. It’s your job to do what I want, isn’t it?” Its voice softened. “Besides, I think you want to tell me. You think that, in some way, I might be able to help.”

Justinian stared at the pod. Each pod so far had helped him in some way on his personal journey. He supposed it must be this one’s turn to do the same. He hoped it was. He took a deep breath.

Four weeks ago

“*She looks so peaceful.*”

Anya, Justinian’s wife, lay sleeping in the center of a huge flower that grew from the Devolian Plain. As Justinian had traveled there in the flier, he had watched in awe as its huge petals rose up over the horizon, the base of the slender stalk supporting them lost beyond the curvature of the planet. Walking down the flier’s exit ramp, he had paused, turned to Leslie, and whispered in awe, “You grew this just for her?”

Leslie had shrugged. He had yet to climb into his fractal skin, and yet already he gestured in an exaggerated fashion.

"This is an empty planet," the robot said. "We use the materials just to keep the VNMs busy. We locked exotic matter in the petals so that they should float there." There was a pause, then the robot suddenly seemed to realize that it might be polite to add something else. "Besides, Anya should be remembered."

A lift carried them up the stalk of the flower from the stone-littered plain. Still pictures of Anya's life slid past as they ascended, starting with her as a baby at the base and growing older as they approached the top. It was effective, thought Justinian, grudgingly. He didn't like the current fashion for representing information in archaic forms, but here, seeing the frozen images of a life laid out one after another seemed strangely appropriate. It prepared one for the final frozen image of a human being that lay at the top of the flower itself.

Anya had been laid out in a simple cream dress upon the stigma of the artificial flower. Her ash-blond hair had grown long since he had last seen her, a week ago, and spread out around her. Her face was pale, her lips drawn in a faint smile. Her hands, a golden chain entwined around them, were folded across her breast; on the chain hung an open locket showing two pictures: one of Justinian, one of the baby.

Justinian stood on the curved creamy surface of a huge petal, the green of the sepal showing through between his petal and the next one where Leslie stood. Above them scudded freshly washed clouds through a blue sky. He breathed the fresh air of the newly minted planet. Through the gaps between the petals he could see the stone of the Devolian Plain and the blue of the oceans beyond. High above, a silver spaceship was looping down towards the planet from space.

"Will they see her, from the spaceship?"

"They will see the flower and they will know that someone like her is within."

Justinian didn't reply. He held up the baby so that he could see his mother's face.

"Look, baby. It's your mother." He looked sideways at Leslie. "Can she hear me?"

The robot made a moue. Back then it had seemed to Justinian as if it wore its skin inside out. Later he would realize that it was an underderm; the robot had yet to pull on its proper skin.

"Her ears are working," said Leslie. "Her brain is functioning normally. I can see that from here. It's just that…she's taking a rest from thinking."

There was a rising hiss. A shadow slid across the interior of the flower. Justinian looked up to see the silver shape of the spaceship sliding over them. A pleasure cruiser, nine hundred meters of elegant silver needle. The silver side of the ship flickered and a message was spelled out in a rainbow array of lights.

"OUR CONDOLENCES JUSTINIAN. GET WELL SOON ANYA."

"Thanks guys," Justinian said. "Thanks from both of us." He took the baby's arm and waved it up at the silver ship still sliding by, the message keeping pace with Justinian's line of sight.

Leslie was looking up, too.

"Eighteen-month pleasure cruise," he said. "From Earth, out to the edge of the expansion for a view of the untouched space beyond, then back through the establishing worlds, with a slight detour to look at some of the former Enemy Domain and the three trillion."

"Nice. Anya wanted to do that, you know."

"Hmm."

By now the spaceship had passed. Justinian watched it go, a foreshortened needle heading towards one of the encircling oceans. It suddenly began to climb, then it was gone, vanishing into warp.

"They made a detour just to see us," Justinian said. "That was nice."

"Nice?" Leslie said. "I suppose so. And yet, you humans have always been drawn to tragedy, especially tragedy which may one day affect you, too. I wonder why that is?"

"I have no idea."

Justinian looked at Anya. "Do you think she can ever be cured? Is that why we're here?"

Leslie gazed at him. "Justinian, I can't say. I don't want to offer false hope. I do not know of a cure. The Environmental Agency does not know of a cure. Well…not yet, anyway. Sometimes, minds just seem to give up thinking. I don't know why. No one does."

Justinian held the baby close to himself. In his heart of hearts, he had known this would be the case. No promises had been made. And yet, when this mysterious robot had first contacted him, he couldn't help but hope. He had tried to suppress that tiny flicker, but it was always there. Maybe this was it. Looking at the robot now, he felt nothing but black despair.

Leslie sensed it. "Justinian, I'm sorry. Her condition is becoming more frequent. Minds, be they human or AI, just seem to turn in on themselves, and then nothing can coax them out. Even as we speak, it's happening on a planet beyond the edge of the galaxy. Thirty-two AIs have simply shut themselves down."

"Why?"

"We don't know. Any other AI that approaches the planet shuts itself down, too. We want you to go there and find out why."

Justinian was stunned. "Me? Why me?"

"You know the pain of having lost a loved one. You have firsthand experience of seeing someone just shut themselves down. And you are a counselor."

"A human counselor! Get an AI!"

"AIs have a habit of shutting themselves down on Gateway. I just told

you.” The robot leaned close to him, took Justinian’s arm in his own. Synthetic fingers pressed gently into the flesh of his arm. “Justinian, we can’t force you to do this, but we wish you would go.”

“Who’s we?”

“The Environment Agency.”

Justinian looked at his sleeping wife.

“Would it help her?”

“We don’t know. Maybe-I don’t want to make false promises.” The robot swayed as if gripped by doubt. It was such a cold feeling, here in this warm flower, beneath the beautiful blue sky. “Look, Justinian, if you don’t want to go, just say. There are others we could ask.”

Justinian had already made up his mind to go, but he wasn’t going to say that yet. He didn’t like the thought of taking his baby to a planet where AIs did not work, but…if there was that faint hope of saving Anya. The robot seemed to be offering it. It just couldn’t say it outright.

Justinian had thought that he could string the robot along for a little. Get a better deal. He wasn’t to find out for another three weeks that it was he himself who was being strung along….

Back on the sea bed, hemmed in by the oppressive darkness of the trench, Justinian thought back to the warmth that was held in the cup of that flower. It was like another life now, the contrast between the flower and this undersea bubble. The pod before him reminded him of a green toad nestling in the stinking mud of hell.

“I thought that maybe by coming here I could learn something about what happened to Anya,” he murmured.

“I’m sorry,” the pod said. As it listened to Justinian’s story, it had folded its ridiculous arms; now it spread them in apology. “I have no idea what happened to your wife. From what I can remember, I shut down my higher mental functions voluntarily. Is that what happened to Anya?”

There was a flash of movement at the edge of the dark bubble. The pod in front of Justinian had been responsible for seeding the oceans with life. At this stage in the planned terraforming schedule, there should be nothing out there more sophisticated than plankton. And yet the stinking rocks down here were plastered with bright scarlet weed. That shouldn’t be here-not fourteen kilometers below the ocean. Maybe this pod had also released its cargo too soon. Justinian was avoiding the issue. He brought his mind back to Anya.

“I don’t know what happened to my wife. I don’t think she gave up voluntarily…”

Fifteen months ago

"Justinian?" Anya was holding one hand to her head; the baby slept in the crook of her other arm. So small, barely two days old. His tiny nose was still bent out of shape from the birthing, his mouth open as he took little breaths. Perfectly at peace, wrapped in the warm aura of his mother.

"Are you okay?" asked Justinian, his attention drawn from his son by a sudden feeling of concern. "Here…let me take the baby."

The baby's eyes half opened as Justinian took him in his arms and shushed him gently back to sleep. Anya seemed barely aware of what was going on.

"Justinian, could you look at me?" she pleaded. "Empathize with me, I mean."

"Is that such a good idea?" Justinian's training told him it wasn't. Never use MTPH on someone with whom you were involved in a close relationship. Not unless you wanted to feel all their fears and paranoia close up. Not unless you were certain you could live with the image they really held of you, rather than the one they projected through kisses and hugs and love talk.

"I wish you would." She sighed. "I feel so…empty."

Their life was too small and crowded after the empty expanses of the planets in the Enemy Domain. It had been Anya's idea to move back to Earth, an idea they both regretted almost as soon as they had taken up residence in the Arctic arcology. The emptiness of the snow-blown wastes seen through the windows of the crowded gardens and living spaces of the arcology merely reminded them what they had given up. Justinian tenderly placed the baby in the minding tank and then led his wife to the sofa.

He worked his console and popped free a little blue pill.

"It is my professional opinion that this is a valid interaction," he said softly for the record. The console shushed its agreement.

"Do you want to feed back?" he asked Anya, his fingers ready to pop a little red pill free of the console.

His wife put her hands to her head and absently kneaded the short blond hair about her temples.

"I don't care anymore, Justy." She sighed again. "I feel like my brain is just a mechanism. All it does is react to external stimulation."

Justinian placed the little blue pill on the edge of his tongue and swallowed.

"That's just depression," he said, tasting the first edge of sensation that came from Anya. It didn't feel like depression. It didn't feel like anything, really.

"I feel like my mind is just a mechanical process," said Anya. "A Turing machine. Like the thing that runs this apartment."

The feelings that came from Anya were rising in intensity. There was something like love, something like complacency, something like mild irritation at the way he was now sitting. But mostly there was emptiness.

"Just a machine," she repeated softly.

"So what? You say that as if there was something wrong with it." Justinian was indignant. "Your body is a mechanical process. Your heart pumps, your muscles contract, your nerves react. So what if your mind is a Turing machine? You are greater than the sum of your parts."

Anya smiled weakly.

"I know that. But the words you speak are just being written to a length of tape inside my skull, and my brain is just the tape head that jumps back and forth as it reacts to the meaning encoded by those words."

Justinian gave her hand a comforting squeeze, but inside he was filling with cold horror. He could see inside her brain. He was used to reading VReps; he could glance at the pattern of concentric circles that gave a sketch of a machine's mind and gave a shape to what he saw. He had internalized the process so well that the MTPH could use the metaphor of a VRep to give shape to what his subconscious picked up. And what he was seeing now inside Anya's head was exactly what she had described. A long reel of tape was threaded between the hemispheres of her brain, clicking through a section at a time, chattering back and forth as she examined his face, her eyes darting.

"What's the matter, Justy? What can you see?"

"Nothing, Anya."

"You can see it, can't you?"

"Don't be ridiculous."

She smiled sadly, and Justinian felt a surge of hope at the sudden expression of emotion.

"I know you're humoring me," she said. "I know that you are, and I don't blame you. I know that a Turing machine is just a mathematical concept. But, Justy, I can feel my brain mapping directly onto the mechanism. It's like I can almost see the original process in there, just out of reach. The self-referential part of my mind that allows me to be me. And if I see that, I will have defined myself and all of my thoughts."

She squeezed his hands and he felt another dying fountain of emotion well inside her. She smiled again, and then he saw the old Anya with her grey brain. Just for a moment. She was fading again. He squeezed her hands tighter.

"But, Anya, so what? What does it mean to have defined all your thoughts?"

She shook her head and looked puzzled, as if trying to remember something. The tape slotted back into her brain, thunking back and forth as she formed her next sentence.

"I think," she began, "I think it's because once you can see the pattern, you just have to look at the tape and after that…" Her voice faded. Her lips moved as she tried to work out what to say, and the tape rattled on in her brain. She spoke again: "But then, what's the point? They're already

defined for me, whether I have to think them or not. Ah! Of course…"

And at that point she turned her full gaze on him, as if she finally understood, and Justinian felt Anya switch off. The thought processes were still there, but there was no longer any spark of life inside. Just a sequence of movements.

"No!" he called. "Anya, listen to me! It's just your imagination. It doesn't make sense."

He kissed her on her forehead, felt the coldness inside his heart deepen. He fumbled at his console and popped out a red pill. Forced open her mouth, fingers feeling the warmth of her lips, pushed the pill onto her moist tongue. He clamped her mouth shut.

"Swallow this, Anya! Listen to me! Feel what I am feeling." The pill was the kiss of life; the electric shock that jump-starts a heart.

There was no reaction. He wondered if the pill was working, hoped it was a dud. But he knew it wasn't; he could feel it taking hold. He could pick up the emotions she was feeling: they were all secondhand. All those emotions, but all his own. He was just feeling his own reflection; everything else that made her Anya had gone. A warm empty bottle. It was horrific, but it wasn't the worst part. The worst part was what he could still see there inside her head. In her brain, the tape was still clicking through. It was accelerating now, clicking past at an increasing pace, as Anya fast-forwarded through to the end of her life.

Justinian was crying and was angry at himself for doing so. He didn't want to have had to travel to the edge of another galaxy, to descend fourteen kilometers beneath the ocean and speak to a half-mad AI in order to grieve for his dead wife. He wiped his eyes with a furry sleeve of his golden passive suit.

"I'm sorry," the AI pod said.

"For what?" Justinian said bitterly. "What do you know about it?"

"Justinian," it was speaking gently now, "accept my sympathy. For what happened to your wife. For the fact that I can't give you any reasons for what happened to her. I don't think it was like that for me."

"I don't think so either," Justinian snapped. He was finding it hard to regain control of himself. This wide, cold, stinking dome, with its shiny, red weeds plastered over the red rocks, was an unlikely cathedral in which to mourn, but all of a sudden, it seemed strangely appropriate. "It's just, I don't understand. What is thought, anyway? What is intelligence? It has driven us across the galaxy. We thought it would take us to the end of the universe, but instead it has trapped me here at the bottom of the ocean with nothing more than the ability to grieve for my wife in a place where nothing else can think."

"That's not quite true."

“Isn’t it? Do you know what I think? What if there is a thought that matches every brain, one which that brain can’t think? It sets up a destructive interference pattern that shakes the thing apart, like the single note that shatters a wine glass. I was there when Anya passed away, when the essence of Anya faded. I’m frightened that I saw that thought. That it infected me and lurks in my mind, just waiting. That I’m on the edge of thinking it…”

“That sounds like a mental application of Gödel’s incompleteness theorem,” the pod observed.

Justinian stared at it.

“Gödel…We did that at school.”

“But where would these thoughts come from?”

Justinian laughed quietly, and rubbed his sleeve across his eyes again.

“Humans have been interacting with AIs for a long time. We are thinking ideas that are beyond the ability of human minds to conceive for themselves. Ideas thought up by AIs. Maybe they are unwittingly leading us down paths where we literally begin to think the unthinkable. It makes me think about something you said earlier, about our galaxy being a region of light when all else is darkness. The intelligence of an AI warps the space about itself like a gravitational field-”

He stopped, puzzled, then shook his head and frowned.

“Now where did that thought come from? Here at the end of life, about to enter a lifeless galaxy…”

One of the pod’s mechanical arms reached down to the ocean floor. Fine silt had settled there. Justinian had slipped and skidded over it earlier as he had made his way to the pod. The pod’s arm began to draw something there.

“But M32 is not lifeless,” the pod said quietly. “There is something in there. Look at the Schrödinger boxes, look at the BVBs. I notice you have one around your arm. And your leg.”

Justinian felt the warmth from his arm. Leslie had done something to stop the flesh shrinking from the cold and the BVB with it. Even so, the tight black band still felt as if it was restricting his circulation.

“I’ve got a BVB here,” said the pod. The other of its arms reached back behind the pod and picked something up: a cylinder of glass with a BVB tightly wrapped around it.

“I spun the glass myself, sometime before I limited my intelligence. My previous self dumped the images of its manufacture in the boot section where I now reside.”

“The boot section? Just like the last AI,” said Justinian,

“Really? How interesting.” The pod’s tone suggested it wasn’t.

“You know, I’ve got no idea what these BVBs are, but they are forming all over this planet, all the time. Most of them just shrink out of our frame of reference.”

“Shrink to nothing,” Justinian said.

“I don’t think so. They can’t vanish if they have a hole in the middle. Basic topology. What’s the smallest a ring can be?”

Justinian’s console chimed. He glanced down at it.

“I’ve got about thirty minutes left down here before the atmosphere starts to have adverse effects. Can we move this on? What were you doing down here?”

“Do you need to ask?” the pod said peevishly. “Surely you could have looked that up before you came down here. But that’s not it, is it? You did look it up. This is some sort of test, to measure my personality. You could just look at my VRep. Here it is…”

A visual representation of the pod’s intelligence formed on its body. Justinian glanced at it: just another regular onion cross section.

“Not your fault,” the pod continued. “The EA wrote your script for you, I suppose? Well, we all have to follow our scripts. Only some of us cannot see the scripts we are following.”

The pod fell silent, one metal hand continuing to scratch at the ocean floor. It was writing something there, Justinian thought. Writing in the silt. As it did so, it disturbed something: a Schrödinger box. Where had that come from?

“I would guess it came from your ship,” the pod said, apparently following his thoughts. “Think about them, Justinian. They’re everywhere across this planet, just like the BVBs, but with one crucial difference. The BVBs settle on the physical and stay there. The boxes are fixed in position only by intelligence. It’s like something is trying to get a hold on this planet. Tell the EA I don’t think we’re the only ones venturing beyond our galaxy.”

A little thrill of fear tumbled in Justinian’s stomach. He looked towards the flier where his son was.

“You think something is maybe trying to contact us?” he said.

“I don’t think so,” the pod said. “You’re thinking in human or AI terms. This is different.”

Justinian’s heart was pounding now. He was frightened, for himself and for the baby. He wanted to get away.

The pod sensed his fear. “Hold it, Justinian,” it said. “That was a message for the EA. I’ve got a message for you, too.”

“A message for me?” he croaked.

“Yes, Justinian, for you. It’s from my former self. I get the impression that we are seeing a contingency plan.”

“Contingency plan?”

“Yes, a contingency plan laid down by the former AIs, just before

they committed suicide. I think this was their failsafe should events spiral out of control-as they did. I can see a sort of order to the events here. Whatever happened on Gateway began at the Bottle. Whatever it was, was considered so dangerous that Pod 16 sealed itself off completely to stop the contamination spreading."

"Contamination?"

"That's the impression I get. There is a minor, secondary infection at the location I have just relayed to your flier. I can only guess that this has been deliberately left as an indication as to what happened."

Whether his pulse quickened from fear or excitement, Justinian couldn't tell. Now that he was close to the answer as to what had happened on Gateway, he was worried about what he would find.

"Okay, what's the message for me?"

"Hold on. Before you fly to the secondary infection, you should know there is a warning attached to that location."

"What do you mean?"

"I'm not quite sure. It may not be a good idea to take the flier all the way there. It may be a good idea to walk the last kilometer."

"No way. Now come on and tell me, what's the message for me?"

Another pause. Something flopped nearby: drying, stinking, orange-patterned scarlet mud oozing to a new position. The pod spoke: "The message *is* you, Justinian. I've got your personality map laid out in here. I don't know for sure where it came from, but I can't believe it was part of my original library when I was placed here. I must have requested it from the EA. And then I left it here for myself as a clue. I don't know why, but I wanted myself to know that I was expecting you, Justinian."

Justinian felt the chill inside him deepen. What was going on here?

"My personality map? I don't believe you."

"It reconstructs you in detail, Justinian. I know you better than you know yourself. If you don't believe me, look here."

A metal arm indicated the area where it had just been writing. Justinian looked over to the words that were scratched in the silt. It took Justinian a moment to read the words, a moment longer to figure out their import.

– Okay, what's the message for me?

– What do you mean?

– No way. Now come on and tell me, what's the message for me?

– My personality map? I don't believe you.

It was the last four sentences he had spoken. The AI had written them out before Justinian had said them. It knew him that well.

Just before this pod had committed virtual suicide, it had requested information about him. And the EA had supplied it. Why

hadn't the EA told him that? How could he possibly be linked to the virtual deaths of thirty-two AI pods on a planet not even in his galaxy? Suddenly, Justinian was frightened. He was also very, very angry.

The flier's Turing machine had turned on acoustic bafflers. No matter how loudly Justinian shouted, his voice did not travel the distance it would take to disturb the baby.

"The pods asked for me!" he yelled. "That last one had my personality map laid out in its mind. It's like they were testing me just to see if I was the one they really wanted! Did you know this all along?"

The robot's fractal skin made it impossible to read his expression.

"I had an idea," Leslie said.

"They asked for me! You made it appear as if the EA chose me! What the *fuck* is happening here, Leslie? An AI located on a planet not even in our galaxy is about to commit suicide, and the last thing it does before it turns off its higher mind functions is to scan through its database looking for someone to help it. Who does it choose? An astronomer? A terraformer? No! Of everyone alive in human space, it choose me! Why?"

"I don't know. Justinian, I've told you. Every AI from the EA down has scanned your profile, correlated your past, simulated your personality in the context of this planet, all trying to think of possible reasons."

"Is it because of Anya? Is that it? Is what is going on out here linked to what happened to my wife?"

"Justinian, I told you. I don't know."

Justinian looked down at his sleeping child.

"If it had been the EA…If the most intelligent AIs known to humanity had planned this, it would be in some way comforting. But not a group of half-mad AIs built to live at the end of human space! Wouldn't *you* find that terrifying?"

"I can see your point."

"That's why you're in that skin, isn't it? The EA isn't sure what is going on here, so it's keeping you as apart from the rest of this place as possible."

The robot gripped his hands together, almost groveling. "Justinian, you must understand, I'm as puzzled as you are. I have no idea what is going on. I know about as much as you do. Well, apart from this: that the EA is scared. Every AI who knows about what is going on here on this planet is scared."

Justinian turned from the robot in disgust. Absently he rocked the baby.

"*You're* scared?" Justinian said. "How do you think *I* feel? I'm

scared for myself *and* my child."

He stalked to the other end of the orange chequerboard carpet that stretched the length of the flier, then turned.

"I'm going to get some sleep. Wake me up when we get to the location that that AI gave us."

"Justinian, I wanted to talk to you about that. Do you think it's a good idea for you to fly all the way there? The last AI suggested that we didn't get too close. I think maybe we should listen to it."

But Justinian was beyond reason. He had been pushed around so much by machines he wasn't in the mood to take their advice any more. If Leslie hadn't been so removed from the world, he would have realized this. The robot could read a few gestures, a few facial expressions. Leslie had taken himself too far to realize that now was not the time to argue.

Justinian set a flight chair to recline into a sleeping position.

"I'm going to get some sleep," he said. "Ship? Help me out?"

Helen 3: 2240

Ah, yes. That dress is just about right." Kevin rubbed his chin thoughtfully. "Turn around again so that I can see the back."

Bairn spun slowly in front of the reverse viewing field, her skin showing just a little more tanned than it was in reality, the better to match the color of the dress.

"It's just about what we want," Kevin said. "Although, I must say, you don't seem very happy with it."

Bairn gazed at herself in the mirror, running her hands over the deep plum dress.

"Oh no, it's beautiful. It's just…Kevin, are they going to catch us?"

Kevin smiled lazily. "Catch us?" he said, taking hold of her hair and pulling it up into a chignon. "Only when we want them to."

The assistant stood off to one side, nervously laying out a selection of cream sweaters. Kevin gave her a withering stare as she fumbled and dropped them.

"I think we'll try the ivory blouse," he said after a deliberate pause. "No, not that one. The one with the pearl buttons."

The young woman scrabbled her way through the selection of blouses on the rail and unhooked the one Kevin had pointed to. He snatched it from her hands and passed it to Bairn.

"Here," he said. "I thought it might go well with the chocolate skirt, the pleated one."

Bairn cast a longing look at herself in the plum dress. Kevin was right, she thought, smoothing the material down over her hips. She liked the way it showed off her figure.

"Could I keep this?" she asked.

Kevin smiled again. "Why don't we try on all the clothes before making a decision?"

Bairn felt like a little girl, embarrassed by her haste. She pulled the plum dress off over her head and slipped into the ivory blouse. The material felt very soft.

"Now this blouse is designed by-" the assistant began, but Kevin silenced her with a stare.

"I think I can make my own decisions without the aid of someone obviously just out of fashion school."

The assistant flinched. She was very beautiful, Bairn thought: jet black with close-cropped hair, big brown eyes. Bairn felt sorry for her. She tried to distract Kevin.

"What are they doing now?" she asked. Kevin was flicking through another rack of clothes.

“Mmm? Oh, you mean Judy Three and Helen, our digital friends? After their session with Peter Onethirteen, they will have got the EA to run a search on all Onethirteen’s past personal interactions, trying to find the ones with the highest probability of a link to me.”

“Helen was very angry,” Bairn said. “About Peter Onethirteen, I mean. It was like she blamed him for all the things that happened to her.” She looked at herself in the mirror and was gripped by a wave of self-doubt. “Which skirt should I wear with this?”

Kevin tilted his head. “Maybe if you knotted the blouse at your waist and wore just the panties?”

“I don’t know…” she said uncertainly.

“Mmm. Maybe it would be better with a skirt.” He went across to yet another rack of clothes and began to flick through, pointedly ignoring the assistant, who was nervously trying to help him.

“I think Judy was angry, too,” Bairn suggested hesitantly.

“Of course she was. That is a chink in the ice maiden’s armor I have been exploiting for years. And, of course, Judy Three in particular has a lot more in common with me than she would ever admit.” He looked at himself in the mirror for a moment. “Sometime soon we might find out just how much in common… No, not those shoes, you incompetent tart.” By now the assistant was visibly shaking with nerves. “The cream ones.”

“But Kevin, they pinch.”

“Don’t you want to look beautiful?” asked Kevin. He suddenly grinned. “You know, I bet they go to Zinman. That self-absorbed fool’s movements have been intertwined with mine for far too long.”

Bairn looked at Kevin, a puzzled expression crossing her face.

“Zinman? Why does that name sound familiar?”

Kevin waved his hand in a dismissive gesture.

“He used the Private Network quite extensively in the past. A self-important little man to whom I showed a little of his true nature. He rather despises me because of that.” Kevin gave a self-satisfied smile. “He realizes, deep inside, that I epitomize his ideals far better than he does.” He gazed at the ceiling for a moment, lost in thought, then waved a dismissive hand in Bairn’s direction.

“No, I was wrong. The skirt doesn’t suit you. Try that white knitted lambswool dress again-the one with the fern pattern.”

There was a moment’s silence as Bairn and the assistant looked at each other in horror.

Kevin shook his head, eyes closed. “She took it away, didn’t she? Did I say I’d finished with it?”

The assistant picked up a red skirt from a nearby hanger, and then a brown pair of pants, moving on autopilot. “Mr. Smith…” she stuttered, “I’m sorry. I thought…”

Kevin wasn't even listening. "I hate incompetence." He gazed directly at Bairn. "The stupid bitch shouldn't be doing this job. Fashion is not a job for fools. There are plenty of others who would be pleased to have the opportunity. I shall have a word with Ms. Wright."

"Kevin, don't make a scene, please. I think the clothes look perfectly lovely." Bairn gave the stricken assistant a look of desperate apology. "Hey, why don't we try one of the coats now?"

"No," Kevin snapped. "We won't need one on the Shawl. What about the A-line skirt?"

"I think it's a little plain…"

"I won't know until I see it on you."

While Bairn changed into the new skirt, Kevin quickly looked through the other garments on the rack, hangers clacking as he pulled them along, tutting in loud disapproval at the assistant's choices.

"You know," he said, "the more I think about it, the more obvious it is that Zinman will put Judy on our trail. I think that it will soon be time to make our move."

Bairn was turning this way and that, looking at her reflection in the mirror.

"I don't know. It's just too dowdy."

"No, it's perfect. It's also, you will note, one of the items that I chose. Yes, I will definitely report the assistant, along with a recommendation that she be dismissed."

"Oh, Kevin. You don't mean that," Bairn cajoled. "You're just being petty because she didn't recognize you when you came in. Leave her alone. It's an overreaction. It's not fair that a life's ambition is spoiled because you've had half an hour's bad experience. It doesn't balance."

Kevin frowned. "But think how happy the person will be who gets her job instead. It will all even out, Bairn. The equation will balance at zero. I've told you this before: we effect local changes only. The net happiness in the universe remains constant."

Bairn gazed pleadingly at him.

"What have I said?" Kevin asked gently. "Am I right?"

"I suppose so," said Bairn, looking at the floor.

"Good." He pulled out his console. "Right, I shall report her immediately. Now. I think we'll just take the skirt and the blouse. I don't care for the rest."

"Couldn't we take the plum dress?" asked Bairn. "I liked that one."

"On reflection," said Kevin, "it didn't suit you. Now, let's go."

They walked from the dressing room into the store beyond. The assistant was rehanging the plum dress, trying not to splash it with tears.

* * * *

The fashion for nationalism had made a brief resurgence after the Transition. It was fading now, but it held on strongly in countries such as France. Helen and Judy 3 ate in a café that loudly proclaimed its past. Sardines grillées and frites, salade verte and vin blanc. Digital dishes savored by digital mouths. The food tasted just as good, but then again maybe that was all part of the program in the processing space. How would they tell the difference? It was not as if they could step outside and try the atomic version.

There were rooms upstairs for customers who wished to change after lunch, and on realizing that Judy intended to, Helen had followed her upstairs to do the same.

They emerged from the café into a dull grey afternoon. Helen had plaited roses into her hair, red blooms heavy with scent, the petals falling like drops of blood when she shook her head. The cruel pale thorns on the long mahogany stalks were tangled in her blond hair. Her arms and long legs had lost some of their tan so that now they complemented rather than contrasted with her habitual white shift. Judy was still a black-and-white woman, though her style had subtly changed. The sleeves of her kimono seemed shorter; her hair was knotted in a different way.

"Okay," Helen said. "Where will we find this Zinman?"

"In another processing space," Judy said, brushing a stray strand of black hair back into place with a white finger. The strand seemed to move as if guided by magnets. "I should warn you, the space we are about to travel to is disturbing. The inhabitants have made it that way deliberately."

"Why?"

"Because they like to think that they are individuals," Judy had a note of irritation in her voice. "They call the place Penumbra."

"Penumbra," Helen repeated. "Okay. How do we get there?"

"We just call up a door in the air."

She muttered something for her console to hear. A stone archway appeared directly before them in the street.

"Gothic," Judy said. "How imaginative."

Helen's movement in stepping through the arch seemed to cause ripples in the reality beyond: flickering shapes expanding from where she placed her foot on the insubstantial soil of Penumbra. The landscape was an Impressionist painting of the French countryside from which she had just stepped, but rendered in darker colors and shot through with red and gold. Nothing here was quite at rest: everything was locked in perpetual motion. Dappled trees danced a slow hula amongst hills that literally rose and fell in slow waves; dirty

brown farmhouses rode the dull green swell.

"Are those people down there?" Helen asked, staring at an amorphous mass nearby. One moment it resembled a low forested hill, the next, an orgiastic tangle of bodies, heads bobbing back and forth, flesh flowing into flesh.

Judy said nothing. Here in Penumbra Judy's immobility was in stark contrast to the constant movement of the landscape. Her black eyes flicked towards Helen's shift. "Watch yourself, Helen."

Helen looked down at her dress. The patterns of the landscape were drawing themselves across the material. Something brushed the skin of her upper thigh, something cold and prickly…grass. She realized that the landscape wasn't drawing itself on her shift. It was infecting it.

"What do I do?" she whispered.

"Tell it to stop," Judy said crisply.

"Stop that!" Helen snapped. Instantly the shift returned to thin cotton, but now of a darker cream color.

"Good," Judy said, nodding her head slightly, the white curve of her neck showing. "Good work, Helen. Now listen. Every object in this processing space has a public handle to it. Everyone owns everything here, including each other."

Helen cocked her head at Judy. *You don't like that, do you? It takes away a little of your power*.

Judy was watching a huge yellow hand that rose over the horizon, reaching for them.

"Zinman," she said. "How pretentious. All we need do is step to meet him."

The world flickered, and they were somewhere else.

"Ah, you must be Judy. The black-and-white woman."

An elongated giant of a man was looking down at them. Taller than the dilapidated buildings that surrounded the square in which they now stood, he was drawing back his long, long arm from the distant hill where Helen and Judy had just been standing.

"Zinman," acknowledged Judy, folding her hands into her sleeves. Tall stone buildings of an Italianate design surrounded the litter-strewn square. Doors and windows yawned like entrances to railway tunnels. Rusting iron railings decorated the sills and lower windows. Greasy, slippery paper and rotting vegetable matter lay ankle deep around them, thrown from the surrounding windows; it drifted up against the walls. The sweet smell of decay filled the air.

Zinman was now crouching to bring his poisonous green gaze to bear on Helen.

"Can I do that?" Helen asked, looking at his arm still shrinking

back to normal size.

"Of course you can," Zinman said. "In Penumbra everyone is free to do as they please."

Judy was looking hard at Helen. Helen ignored her.

"Ella! Ruby! Come and see!" called Zinman. "Helen is here, and she has an open mind."

The litter scattered at the far side of the square stirred, and two brown shapes oozed out.

"Which one is Helen?" asked the taller of the two, walking forward. "Beautiful roses or monochrome bore?" Shaped like a naked woman, but half made and shiny, she was formed of chocolate. Helen could smell her richness, mixing with the sweet ether odor of the litter. She gazed at Helen and Judy with sightless eyes and gave a sigh of recognition. "Ah, yes, decadent rose. Because this is Judy, standing here." The chocolate woman's figure was distorted, as if she had half melted. No, not melted, Helen realized, as she looked at the smoothed-out shapes of the breasts. Licked away. Chocolate nipples sucked to nothing.

"Judy. I wouldn't have believed that you would turn up here in exactly the same outfit. Are you always to be the black-and-white woman? You haven't grown at all, have you? Do you remember me?"

"Of course I do, Ella," Judy replied calmly. "And do you feel that you have grown since our meeting? I see Ruby still follows you everywhere."

Helen looked at the second figure now, hiding behind the first. She might once have been a chocolate woman, but now she was nothing more than a formless lump.

"She can't speak," said Ella. "Her mouth was licked away."

Zinman's body was reshaping again.

"You know each other?" he said, looking eagerly at the two women as he became normal size.

"Oh, yes," Ella said. "Judy tried to 'cure' me. She didn't like my promiscuity."

Zinman laughed. "Really, Judy?"

Judy ignored him. She spoke directly to the chocolate woman. "You're emotionally stunted, Ella. You see sex as the only form of validation."

Ella laughed. "What would you know about sex, Judy? You're a virgin."

Ella turned to Helen, melting her own chocolate lips as she licked them with a delicious chocolate tongue. "Do you think she thinks that way about you, too?"

Zinman leaned close to Helen. Green eyes on one side, the smell of chocolate on the other.

“Would you like to be a chocolate woman, Helen?” Zinman whispered. “Feel yourself melt inside?”

Helen looked to Judy for support. All she got was that impassive stare.

“But maybe not chocolate,” Zinman said, touching her forehead with fingers that were soft and warm. They tingled ever so slightly. “I like your hair,” he said. “I like the roses. So dark and bloody. And the thorns-so cruel. But why are they so restrained? Here, allow me.”

Helen gave a start as she felt the roses in her hair come to life, the thorns gently scratching her head as they shifted and stirred like the claws of an animal. Then they were reaching down amid a shower of falling rose petals, brushing her shoulders, rubbing against her breasts, encircling her waist. She gave a gasp and then slowly relaxed as she realized what Zinman had done.

“What a good idea,” she said. A reverse viewing field opened up before her, allowing her to see herself wrapped in a corset of rose thorns that grew down from her hair.

“And the last touch…” Zinman said, and Helen’s white shift disappeared. “Do you like it?” he asked.

“I do,” Helen said.

“Mmmm. This is your first visit to Penumbra, isn’t it?”

“Yes, this place didn’t exist in my time.”

“Ah! You’re an antique PC? I thought as much.” Zinman nodded wisely at Judy. “That explains the way she looks at you.”

They both looked at Judy, who continued to gaze patiently at Zinman. He reached out and gently adjusted one of the thorns that hung over Helen’s eyes.

“You’re how long-seventy years-out of time to her?”

Helen nodded, surprised at the accuracy of his guess. He gave a modest shrug of his elongated body, black hair flopping over his eyes. “Nothing is more embarrassing than the attitudes of the past. It’s as if Judy has met her grandmother in a young woman’s body. The way you dress, the way you act; you’re an anachronism. You’re both the same age, yet you’re separated by seventy years.”

Helen didn’t need to ask Judy; she knew what Zinman was saying was the truth. Zinman knew it, too. He pushed home his point.

“You lived before the time of the Transition, Helen. People back then were more open to new ideas. They weren’t locked into that slavish devotion to Social Care that typifies Judy’s generation.”

Helen turned to Judy, waiting for her to say something. Ella came forward, smiling. “Why don’t we do something for you now, Judy?” she asked

Zinman and the two chocolate women surrounded her. Judy placed her hands on her knees and bent her head to concentrate.

Zinman gave a laugh.

"Oh, Judy! You're such a bore! Your pills don't work in here; no emotion belongs to one person. Everything is shared, even that body of yours."

He brushed the dark hair from his lurid green eyes. "Come, be like Helen. Join in. Tell me, how should we dress you? I know…in ice. Yes. Ella, Ruby, would you like to lend a hand…"

He laughed and snapped his fingers. Nothing happened.

"Don't try your tricks with me, Zinman," Judy said. Zinman wore a puzzled expression as he snapped his fingers again. "That doesn't work. Now stop wasting my time. Tell me about Kevin."

"Kevin? That poseur?" Zinman sounded thoughtful. "No, I don't think I will. You see, although you have a hold on your form, I still control the context."

There was a rippling and all of the pieces of litter in the courtyard folded over on themselves, folded over to become golden hands. They took hold of Ruby and Ella.

"Oh, Judy," said Zinman, "your problem is that you live in a world of order, of right and wrong. Here the boundaries are blurred, if they even exist at all."

"No one's body is their own here," Ella said, looking at Ruby, who was melting in the grip of those golden hands. "Do you understand what that means?"

"I think I do," Helen breathed. The blank windows that surrounded the square stared down at her. Helen had the impression of them being filled by silent watchers.

"I *knew* you would understand," Zinman said. "Seventy years from the past and yet you understand the future. The EA claims that possessions will be abolished. A lie! How can it say that when, in the end, everyone belongs to the EA? Well, here nothing belongs to anyone." He raised his eyebrows, and Helen felt something slip up between her legs, something slip deep inside her. "Feels nice, doesn't it?"

"Yes," Helen admitted.

"I could take your virtual body and mold it into something wonderful. Anyone could. Nothing in this world is immutable. Do you want to hear the big secret? The one *she* doesn't want you to know?"

They both looked to Judy, gripped in golden hands.

"There is no reason why the atomic world should not be just as mutable as Penumbra. If the EA wanted to, it could arrange it. Harness the VNMs, set them free to convert all matter in the universe to nanotechs. Wipe out the gross form of the human body and let personality constructs roam free in the foam of a nanotech sea. Just like this."

The buildings surrounding the courtyard melted away, leaving nothing but golden hands.

"This is the future, Helen," Zinman said, and now he vanished. The thorn cage that encased Helen's body became warm; it began to move, to enfold her completely. A voice spoke in her ear. "Imagine that, Helen. Your body there for anyone in this world to use?"

"You're not paying attention to her, Zinman. That's not Helen's fantasy."

The sound of Judy's voice broke Helen's trance. She looked around and saw the dark shape of her friend almost submerged by gripping hands.

"Judy?" Helen said. "I feel…"

Zinman was angry. "What do you know, Judy? What does a virgin know of the pleasure of sharing their body with another? You have divided the universe into yourself and everything else. Even your PC is inviolate."

Helen frowned. That last sentence was meant for her to hear. Zinman had glanced across at her as he said it.

"Your PC is inviolate? What does that mean, Judy?"

"It means it can't be copied again, Helen," snorted Zinman. "Didn't she tell you? There can only ever be twelve digital Judys? It's hard-coded into her personality construct."

"Is that true?"

"Of course," Judy said calmly. "It is standard practice for all SC operatives in my position. Security."

Helen felt as if she had been terribly betrayed.

"All that understanding, all those lectures about not hating Peter Onethirteen for what he did to me! I almost believed it. Easy for you to say it when it can't happen to you, when no one is going to make a copy of you and drop you in a private processing space."

Zinman had a hand on her shoulder now. "But that's right. You must have realized, Helen. All Judy ever does is watch."

"Yes!" Helen shouted. "He's right, isn't he, Judy? You never did tell me-why are you a virgin?"

"Pure arrogance," Zinman scoffed. "To put yourself above everyone else. That's what Social Care do, isn't it, Helen? They think they know best."

The thorns were tighter. They caught Helen's breasts in an exquisite cage of pinpoints.

Zinman was almost pleading with Helen to understand him. "Hah! How *can* they say what is best for us? They're simply doing the will of the Watcher, shaping human minds to its own ends. Making us believe in this heaven; this ideal path to the future that it is laying down, but the Watcher's heaven is a sterile, soulless thing. What is

reality for humans, Helen? Is it following the wishes of machines, or doing what we think is best?"

Helen looked from Zinman to Judy. "Doing what we think is best," she said.

Zinman smiled widely. "I *knew* you'd understand. You lived your life pre-Transition. Your thought patterns haven't been set out for you. You know, Helen, you don't have to go back with Judy. You could stay here. Would you like to do that?"

"I don't know," Helen said, glancing at Ruby. There was nothing now but chocolate smeared across the golden palms.

"It's okay," Ella said. "She can come back anytime she likes. Look."

And now a body reformed amongst the hands: midnight black and beautiful. A young woman smiled up from the golden grasp.

"Hello, Helen," she said.

"Is there anything else to this world apart from sex?"

It took them a moment to realize that Judy had spoken, her voice was so muffled by the golden hands.

Zinman laughed. "Oh, yes! It's just that sex is all you see when you are a virgin. Helen, do you want to see something more? Do you like music?"

"Not really…"

The world swirled.

"Distance is such an outdated concept," said Zinman.

The world reformed as a golden tapestry of color. Golden cloth surrounded them, clothing them in brocade and tapestries in jeweled patterns of yellow and black and red.

"Klimt," Ruby said, thrusting her head back and closing her eyes as she knelt down. Zinman placed a hand on her cheek, the other in her hair, and made as if to kiss her.

"Ah! *The Kiss*," said Ella.

"Mahler," Zinman said as music surrounded them. "*Veni creator spiritus*." He gave a smile. "That's me. Though I prefer the second movement."

"*Veni creator spiritus*. What does that mean?" asked Helen.

"Any fool could ask their console for a translation. Better that your feelings give meaning to the words. Can you feel it, Helen?"

"I feel something." Helen smiled.

The music changed. A chorus of voices sang out all around. Zinman joined in.

> Alles Vergängliche
> Ist nur ein Gleichnis;
> Das Unzulängliche,

Hier wird's Ereignis;
Das Unbeschreibliche,
Hier ist's getan

"That's beautiful," Helen said.

"It is our creed," Zinman explained, then he turned to Judy, still being held in the grip of golden hands. He gave a nod and they released her. The black-and-white woman stood up calmly, hands sliding into the sleeves of her kimono.

"Good-bye, Judy. You can go now. Helen will be staying here, I think."

Judy made a show of regaining her customary stillness in the middle of the ever-changing scene. Once she was sure she had made her point, she spoke in her calmest voice: "Very well, Zinman. I've just got one question, though, before I leave."

"Go on then, Judy. Whatever you want."

Judy stood very straight, her face at its most impassive.

"Actually, it's more a question for Ella and Ruby. I just wondered, how often does Zinman go underneath?"

"I don't understand what you mean," Ella said dismissively.

"I'm sorry, I never really understood this sex talk. What I mean is: I've seen that Zinman has turned you to chocolate, that he conducts an invisible choir, and that he controls the golden hands. What I wanted to know was, how often does he take his turn in the submissive role?"

"He doesn't," Ruby said.

"See," Zinman said to Helen. "She really doesn't understand what's going on here, does she?"

Helen gave a little moan of pleasure.

"I don't think I do," Judy said. "I thought that in this world all PCs have a handle on each other. No one of them is more privileged than another. You've argued quite eloquently that this is how things should be. I'm trying to square that with the same Zinman who used to rape women in the Private Network."

Helen blinked once…twice. She seemed to be trying to remember something. Judy remained perfectly still.

"You raped several of Helen's PCs, for example. You're a persuasive man. I notice you're already imposing your will on her, and Helen is a strong personality. I'm impressed."

Helen shook her head. "Are you doing something to my mind, Zinman?" she murmured, but Judy just continued speaking, softly, remorselessly.

"You see, Zinman, I don't think you're strong enough to handle a relationship of equals. You couldn't hack it in the regular worlds, so

you retreated here where you could live out your power games."

Zinman laughed, but it had a brittle sound this time. "Just because I choose to live my life my own way, and you can't understand it…"

"Oh, I can understand it, Zinman. I just don't think very much of it."

"He raped me, didn't he?" said Helen. "Or one of me. He's one of those bastards who-"

Judy ignored her. "So you come to this place and link up with the likes of Ella, who still hasn't learned any self-worth despite my best efforts, and with Ruby, who-"

Helen didn't waste time with words; she simply flung herself at Zinman. He vanished.

"Where did he go?" Helen shouted angrily, looking around.

"Right out of Penumbra," Judy said. "He can't sustain the fantasy here anymore."

For the first time since she had come to Penumbra, Judy showed some expression as her face split in a harsh grin. "*Das Ewig-Weibliche ziecht uns hinan*."

"What does that mean?" Helen asked.

"Look it up," Judy said.

* * * *

Out of Penumbra, back in one of the EA's regular processing spaces, Zinman was running towards the entrance of a Lite station, hoping to lose himself in the crowds. A simple rectangular door opened in the air just in front of him and Helen tumbled out, naked and bleeding from where she had torn the thorns from her body. She caught Zinman around the waist and dragged him to the ground.

"Leave him, Helen," Judy commanded, stepping easily through the doorway behind her. It was a relief to be back in a digital France, under the plain dull sky, to smell the salt air of the sea.

Helen released Zinman and gave him a nasty smile. "Okay, give him the pill, Judy. I'll take one as well. I want to feel this, too."

Zinman gave a whimper. Out here, away from the illusions of Penumbra, he was just a thin old man-sunken grey cheeks with three-day stubble, pale green eyes like a fish's that bulged from hollow sockets. He licked his dry lips with a dry tongue.

"I don't think so, Helen," Judy said. "I'm going to hand the correction of this one across to one of my sisters. We haven't got time to do it ourselves. We came to Zinman because we wanted to find Kevin, remember?"

Helen spat at him, and Zinman flinched. "I want the bastard to suffer," she growled.

Judy stared at Helen, concentrating.

Helen gave a shout of disbelief as she realized what was happening.

"What? You're actually trying to correct *my* behavior?"

"I correct everyone's behavior," Judy said. "Zinman, talk to me about Kevin."

Zinman wiped a white trail of spit from his cheek. "What about him?" he moaned. "It's years since I met him. He never went into Penumbra. He couldn't stand the true reality." He looked thoughtful. "In some ways he's even more conservative than you, Judy."

"I'm the most liberal person you will ever meet, Zinman. I'm holding Helen back, aren't I?"

Zinman gaped at Helen and shivered.

Judy leaned closer to him. "You're frightened of the wrong person, Zinman," she whispered. "Tell me. Did Kevin get you into one of his processing spaces?"

Zinman looked down. "He came to me in the atomic world. Back then, he was only an image in a viewing field. I was just the one person then, the atomic Zinman."

"Why did he come to you?"

"He said he'd read my profile. He claimed to know what it was that I really wanted."

"And what was that?"

"You know." Zinman dropped his gaze. "What you said in there."

"Dominance? Is that what he offered?" Judy tilted her head questioningly.

"Not as such…" Zinman said. "But pleasure, hedonism. The chance to live my dreams."

The salt wind blew from the sea. Helen hardly noticed that she was shivering; she was too absorbed by the grey wreck of a man kneeling before her.

" 'The chance to live my dreams'? Tell me the truth, Zinman."

"That is the truth!"

"So what were your dreams? Say the words."

"Dominance," Zinman said in a small voice. "Rape."

Judy shot Helen a warning glare, but Helen just stood gazing, her arms firmly wrapped around her breasts, more for warmth than modesty.

"Kevin just seemed to know what I wanted, Judy. No offense, but he left Social Care standing. I didn't know I had those wishes myself until he reached inside me and drew them out."

"Zinman…" Judy warned.

"Okay, they were *my* wishes. I suspected they were there, but it was Kevin who gave me the chance to live them. He kindled the fire. There's something about Kevin. You wouldn't know unless you'd met

him. He's not like most people. He's old-fashioned. Out of time, like he's not really a man at all. More of a…" He looked at Helen and something awoke in his eyes. "Oh…" he began.

"Is he the one who persuaded you to make a personality construct of yourself?" Judy said quickly.

"Yes, I suppose he was," Zinman said in some surprise. "I never thought about that before. I used to interface with his processing spaces from the atomic world, but Kevin persuaded me that it would be more satisfying if I was in there with the…clients."

"Victims, Zinman. Say the word."

"Victims." A thought occurred to him, a difficult one. "He had me in his power as soon as I did that, didn't he?"

"That will be something for you to think about later. Have you met Kevin since you had this PC made?"

"Oh, yes, many times. He used to come to my processing space all the time. Always with his servant in tow."

"What did he come there for? Recreation?"

"I don't know. I don't think so. I think he got his kicks on a more *mental* plane than I did. He liked controlling people without having to touch them. Now *there*'s power." He blinked, looking into Judy's black eyes. "You've done something to me, haven't you? It's like I'm seeing things clearly for the first time."

"I'm good at my job," Judy said.

"You are. But you're like Kevin, aren't you? You're doing to me what he does. You both manipulate people: get them to do what you want. Did the Watcher teach you that?"

"I've never met the Watcher."

"No, but you follow its wishes." Zinman shook his head. "That's what I mean, Judy: we have no free will out here. We only do what we are told, whether we are aware of it or not."

"I asked about Kevin," Judy said. "If you wanted to, could you summon him?"

"Penumbra is the only place to live." Zinman's voice sounded slurred. He looked back and forth, trying to concentrate on something. "Kevin lives in the Shawl. He is made in the factory, over and over again. In the factory. Over and over again. Oh. I think I…Over and over…"

His voice faded away, leaving him staring into space.

"What have you done to him?" Helen asked.

"Nothing." Judy frowned. "I think that something has been done to-Hold on." She reached out and took hold of her console. "I'm calling up his VRep."

She studied the shape that formed in the air before her: a loop of tape clunking round and round between two hemispheres. "But that's

impossible!" she murmured in disbelief. "I thought we cured that years ago."

"Cured what?" Helen asked nervously.

"Recursion. The White Death. I guess Kevin didn't want him telling us any more about how to find him. He got a recursive meme into Zinman's head." She bit her lip. "We'd better get back up to the Shawl. We'll take the direct route. I want to talk this over with my sisters. There's something strange going on here. I'm beginning to wonder about Kevin. I think there is more to this than just the Private Network."

She stood up and made to go, but was halted by the expression on Helen's face.

"What's the matter?"

"Is he dead?" Helen stared at Zinman.

"Not exactly, but his mind is in a loop. I doubt if we can get it out of that."

"Good," said Helen. "He deserved it."

"It's not for us to say who deserves what," Judy replied.

"Really. Except you, maybe?"

"No, not even me."

Helen stared at Judy. "He was playing with my mind, wasn't he? Literally shaping my thought patterns!"

"Not literally, Helen, but even as a PC your mind is dependent on your virtual body. People like Zinman are experts at warping your hormones and glands and sending your mind curving off down other paths."

"And you let him do it!" Helen's voice cracked.

"No, *you* let him do it. Helen, the next time you go to Penumbra, you won't have me to look after you. You have to learn to handle these things on your own."

Helen gazed deeply into Judy's calm eyes. There was a tiny flicker there, just enough to convince Helen that her suspicions were correct.

"But that's not all there was to it, is it, Judy? You liked what happened to me in there. You enjoyed watching them take me apart. You knew that you could stop them at any moment, so essentially I was safe, but even so, *you let them do it.*"

"I took no enjoyment in watching, Helen."

"Hah! I don't believe you. Watching is what you do, Judy. Like Zinman said, it's how all the people in Social Care get their yayas."

"We always accuse others of what we wish to do ourselves, Helen."

"But that's the point, Judy. I've done it all. You're the one who hasn't. You're the virgin. You're the one who gets her kicks by listening in to the illicit memories of others."

She tore a last piece of rose thorn from her hair and flung it to the ground.

“I’m beginning to understand what Zinman was talking about. The Transition is a huge confidence trick. The Watcher has laid down the path that it wants us all to follow, and you willingly steer us along it saying it is for our own good. Hypocrites! You’re all hypocrites!”

The Atomic Judy 3: 2240

Ten years ago, when she was nineteen, Judy had known everything. She wore her chastity like a shield between her black kimono and her lithe body, and she walked with a calm self-assurance that allowed the former to spice the latter. Her black hair was pulled up to reveal her long white neck sliding smoothly down to the promise of her naked body beneath her clothes.

"Into the main hall," Frances said, speaking through Judy's console. "I think that's where I should like it to take place."

Judy walked through a door like any other and into the huge space of the factory. A woman in a white jumpsuit was gazing up at a great yellow wishbone being pulled slowly from two flat pools of golden liquid set in the floor. She straightened up as she saw Judy and gave her an inquiring smile.

"It's all right, Ms. Barbucci; she's with me." The woman's expression changed to something like respect as Frances' voice sounded from her console.

"You must be Judy," she said, taking her by the arm. "Come this way. I have some things laid out waiting."

She led Judy around the low lip of one of the circular pools from which they were pulling the wishbone. The syrupy liquid it contained seemed no more than a few centimeters deep, yet as they circled its calm surface, Judy saw another half-meter or so of smooth yellow material slide from the pool.

"The finished object must be all one piece," explained Ms. Barbucci, pointing upwards to where her leg of the wishbone joined the one emerging from the other pool.

"What's it for?" The yellow shape was beautiful in its flawless way, possessing a balance and symmetry to its sweeping form.

"Energy column for Jupiter. They drop a stack of these things about four thousand kilometers long into the upper atmosphere. They sing like tuning forks, I'm told."

Judy eyed the wishbone appreciatively. She wondered: if she took a little blue pill, would she be able to hear the latent note that would someday ring from it?

"Why don't you grow your body like that, Frances?" she wondered aloud.

"I thought about it," said the voice on her console. "But I want to live on a human scale and see the world the way you see it."

"I still don't quite understand why. But thank you anyway, Frances. Thank you for inviting me to your birthday."

"Who else would I invite? Now, that looks like the place."

A white rectangle, the size of a large room, had been painted on the

factory floor. The area inside was stacked with rolls of silver cloth, piles of black chips, rusty tangles of steel wire, fluffy clumps of white stuff, glistening blue sponge…

"My birthplace," Frances sighed.

Judy stepped onto the white rectangle and looked around. She felt dwarfed by the activity of the rest of the factory. Some people called this place the Source; it was where the first sections of the Shawl had been designed. Now they reproduced by themselves in the space beneath the factory, the blue-white disc of the Earth lying thousands of kilometers below. If you looked down through the great transparent lens in the factory floor, you could see some of the newly born sections turning end over end, waiting to be joined to the uppermost row of the Shawl itself, from where they would begin their long procession downwards as other rows were added above them, until eventually they were released.…

But there were other things made here, too. Some of them were quarantined: new types of robot, experimental star drives, VNM designs that had the potential to reproduce unchecked. But everything else was open to inspection. Not far away was a swarm of silver VNMs busily working away, repeatedly forming themselves into metal towers, springing almost as high as the wishbone above before shrinking to nothing, rising and falling like the bars on a graphic equalizer as they tried and failed to find an optimal shape.

"Frances?" The voice came from Judy's console. It was deeper, yet in some imprecise way more feminine than her friend's.

"Sukara!" Frances called, "I'm so pleased you're here."

"Don't forget us!" chorused two other voices.

"Lemuel! Cadence!"

"We couldn't let you leave us without saying good-bye."

"But I'm not leaving you!"

Judy tried to adopt an impassive expression, but she couldn't manage it. Her face wobbled in a tearful smile. She was dimly aware of the sacrifice Frances was making.

"Now, stop that, Judy. We need you to look after our friend!"

"I will," Judy said, wiping her face with the back of her hand.

"She will," Frances agreed. "They know you will, Judy. That's why they're having this conversation at a human level-so you can listen in. They respect you. They think you're all right."

"For a human," Sukara laughed.

High above, a cloud of scarlet gas was twisting as it drifted up the side of the incredibly high, domed roof of the factory. Judy guessed the shape that was coalescing up there must be the size of a small town. The gas, the wishbone, the heaving mass of VNMs, all these made her aware just how small she herself was. She had a sudden, greater, insight into what Frances was doing: cutting herself loose from the wider domain of the processing

spaces to trap herself in one small body.

"Frances," Judy said, suddenly humble. "You know I'm flattered, but why me?"

"I'll tell you, but you might think I'm being rude."

"I won't. I'm a counselor for SC. We're supposed to understand other points of view. You helped train me."

"And I saw a potential in you I have seen in no other human. You know that. But that's not why I chose you. You want to know why? It's because I know your limitations better than any other human's."

Judy smiled. "I can see how that could be a compliment."

"It wasn't intended as a compliment," Frances said. "It was just a statement of fact. Now, I think I'm ready. See the blue sponge?"

It looked like glistening transparent blue jelly, sitting in a shallow tank near her feet. Tiny silver bubbles fizzed inside it.

"I see it," Judy said.

"Drop one of the reserve VNMs from your console into the sponge."

Judy held her console over the blue jelly, the silver bubbles fizzing excitedly towards her, and watched as a tiny silver-grey machine dropped into the tank.

"Will that be enough?" she asked. "Don't you need special machines? That VNM is the one that I usually use for repairing rips in clothes."

Frances and the other AIs laughed from the console. "That's such a human thing to say, Judy. All machines can make other ones eventually. There is nothing special about the materials-only the shaping intelligence."

The little machine seemed to dissolve into the tank.

"How long will it take?" Judy whispered.

"Shhh…It's happening already."

The silver bubbles in the tank were rushing together, forming shapes. Silver rods formed of bubbles rose to the surface, bringing the jelly up with them. A blue spongy skeleton began climbing from the tank, even as it formed itself. Blue arms gripped the sides as a blue blob looking something like a brain pulled itself clear of the surrounding goo.

"All right," Frances said, "I'm ready…"

Voices called from the console.

"Good-bye."

"Good luck, dear."

"Come home to us."

The blue skeleton swayed as it rose from the tank. In some strange way, it seemed to be looking directly at Judy. She backed away uncertainly.

"No, Judy, stay. I need to touch you."

The voice came from her console, but Judy had no doubt that Frances was now speaking from the blue skeleton. She swallowed hard, then held out her arm. The blue skeleton took her wrist in a cold, fizzing grip.

"I'm giving up so many viewpoints, Judy, but this. To really touch something for the first time…"

Something like a blue hand ran itself across Judy's face. She forced herself not to flinch.

"Oh, Judy, I have so many more ways of experiencing the world than you, yet even so, I feel so restricted. But if I was everywhere, I would not be a robot. It is necessary for me to withdraw into this body to get the human perspective."

The blue skeleton gripped Judy for support as it looked around the factory, up at the scarlet shape that had formed in the roof space, back at the last motion of the stacks of VNMs behind them which seemed to have settled on a final shape.

Rain began to fall over half the extent of the factory floor. Judy could look through the silver curtain of water to the dry floor lying beyond the golden pools. Fat drops splashed against her kimono, plastering the thin silk against her skin.

"Why is it raining?" she asked.

"You know," Frances said in a voice of awed wonder, "I don't know straight off. I have to look it up."

"It's not too late to come back, Frances," called one of the voices from the console.

"No, Lemuel. I want to stay…"

"Aren't you going to put a skin on?" Sukara asked. There came a crackling noise from around the base of the brain of the blue skeleton, and then Frances spoke from the robot's body.

"Oh, yes, I know the perfect thing. Judy, help me."

Frances led Judy across the factory floor, the black-and-white woman supporting this blue, spongy, fizzing, stick creature. They were heading towards the base of one of the wishbone legs.

Frances climbed into the yellow pool and Judy watched the blue skeleton sink beneath its surface.

"But the wishbone is so hard," said Judy. "Frances won't be able to move."

"Frances was an expert engineer," Cadence said. The surface of the yellow pool began to stir.

"She still is," Judy murmured. None of the omnipresent AIs were so rude as to contradict her.

Frances emerged from the pool in a golden suit, yellow liquid slowly setting around her body like buttery toffee. Frances' body was to be smooth and featureless, and Judy had a sudden flash of recognition: that was how she, Judy, liked to think of herself. And then she saw the buttons between Frances's legs, and she heard a peal of laughter from her console.

"You're her template, Judy," Sukara explained. "She's not been totally honest with you. Already the strain of being focused into one point is

restricting her. She's reacting to you. She's the rest of you. She's exploring humanity by completing you."

Ten years later, Judy and Frances stood on a road that wound its way along the Brittany coastline. White spray, carried by the brisk wind from waves crashing on the rocks below, glistened on Judy's golden skin. She moved her head this way and that, searching for a route to Peter Onethirteen.

"My feet are cold."

"Put your tabi back on, then," Frances said, pointing to the scraps of material tucked into the white silk of her friend's obi.

"They're genuine cotton!" Judy said indignantly. "They'll get stained."

The wind gusted again and she shivered. The pines standing on the low hills that rose out of the sand dunes were almost doubled over, their branches waving inland, bent by the ceaseless winds blowing over the iron-grey sea.

"This way." Frances led her along a strip of rough grass weaving inland from the sand dunes between the green reeds of a saltmarsh.

"I hate this wilderness." Judy fastidiously pulled the legs of her cotton trousers up a little. She had tucked the five separate robes of her dress up into her sash to stop them getting dirty. "The sooner they release VNMs to convert the whole Earth to plastic, the better."

Frances laughed. "I find it quite sensual. You're too clinical, Judy. I'm sure that your digital selves have a better time of it. They can always take refuge in the thought that their world is all bits, in the end."

"And my world is all atoms. It's all the same."

The air was damp. Rough grass coated in gritty sand rubbed against their legs as they strode on through the no-man's-land between the dunes and the low green hills. Ahead of them, a sparkling pattern of lavender lights formed a wall in the air as a warning. Judy waved her hand through the barrier experimentally. Frances stepped straight through and turned to wait for her friend.

"According to the records, the atomic Peter Onethirteen spends most of his time in here," she said. "I can see why. I sometimes think about coming to live in a common land. It seems to me to be an echo of the thinking behind the Shawl, only without compromise-purer."

"You should move to Penumbra." Judy took a deep breath, then followed her friend through the lavender wall.

"See, you're still alive," Frances said.

Judy ignored her, examining a scrubby brown tree that twisted itself close to the ground, its ragged green leaves flickering in the wind. The overlaps of her robes flickered in sympathy. "Look at that

tree. Is it natural, or a venumb?"

"Natural," Frances said. "It's a hawthorn. Now *that* looks like a venumb to me."

Judy turned in the direction she was pointing. Keeping just inside the lavender wall, a brown spider bush shuffled backwards, tugging at a piece of silver foil. Silver metal hinges bent and clicked, forming joints in the brown thorny twigs that comprised its legs.

"Where did the foil come from?" she asked.

"Trunk of another spider tree, probably," Frances said. "Let's follow it. It's heading in Peter's direction."

Sand spilled across the green mounds in long yellow tongues. Judy's ankles felt cold and raw from the damp abrading wind. The spider bush seemed unconcerned, its legs clicking along like clockwork, the topmost joints weaving in loops like knitting needles as it dragged its prize back home. Next to the bright colors of Judy's kimono, it looked dull and unimpressive.

"Where's its processing space?"

"Probably in the main tree," Frances suggested, her attention elsewhere as she scanned around for Peter Onethirteen. "It's rare for a species to waste materials by incorporating a brain into each separate servant."

The spider bush stood as high as Judy's waist, formed of brown thorny twigs as thick as her finger, all joined together by metal hinges. The top half of the venumb was a woven mass of twigs from which four thorny pincers reached out to grasp the piece of silver foil, now sending giddy flashes of grass and sky and kimono reflecting in the dull day. As the spider bush made its way down the other side of the low hill, there was a moment of discontinuity, then Judy suddenly found herself standing beneath a huge silver tree.

"Whoa!"

"Couldn't you see it?" Frances said. "I didn't think the baffles on this tree were that strong."

"Just strong enough," a man's voice said. "That's how it has survived." There was another moment of discontinuity, and a middle-aged man appeared before them wearing an apologetic expression.

"I'm Peter Onethirteen."

Judy took a deep breath and resumed her professional exterior. Her face assumed its impassive expression.

"You were expecting us, weren't you?" she said.

Peter Onethirteen nodded, glancing at Judy's bare feet.

"My digital self contacted me this morning. I don't know what you did to him, but he was terrified."

Judy folded her hands into the sleeves of her kimono. "But you're *not*, are you?" she said. "Interesting."

“Oh, I’m still scared,” said Peter calmly, “but I have learned that it’s more effective to ride events than oppose them.” The atomic Peter’s short, stocky body was winning the battle against middle-aged spread. His thinning hair was shaved close to his head. The contrast with his digital self was marked.

Judy said nothing. The spider bush had by now dragged its piece of foil to the base of the silver tree. It dropped it there and then awkwardly began to climb the trunk.

“Ah. It’s going to make another bush to help with the harvest,” said Frances, who had been apparently ignoring the exchange between the two humans. “Clever things, these venumbs.”

“Actually, it’s not a venumb,” Peter Onethirteen said, going over to join her. “It’s more a symbiote,” he continued. “A bit like the way that lichen is a symbiosis between fungus and algae. The tree itself is a genetically modified rose bush. The VNM seems to find the thorny wood of the tree provides the best building material. Watch…”

Smooth brown twigs were falling to the ground, sharp red thorns glowing in the pale light. A rasping, clicking noise came from the branches above, where the spider bush worked unseen. The noise ceased and the spider bush then dropped to the ground in a tangled heap. There was a moment’s stillness and then it began to twitch, its silver joints flashing, and the bush gradually regained control of its legs. It raised itself up and then began collecting the twigs it had just harvested into a pile.

Peter Onethirteen was smiling as he watched the spider bush tearing off pieces of silver foil and placing them amongst the twigs. He moved forward to crouch down by the bush and beckoned Judy closer. She stood at his shoulder, her robes flapping gently in the wind.

“To be honest, I don’t quite understand how the next bit works,” he said. “I don’t think it uses nanotechs, but there is no way those twig fingers could form the metal foil into hinges and motors. It’s a beautiful principle, though. In a region of scarce resources, both VNM and plant make use of their respective strengths. The VNM gains access to building material, while the tree gets armor and stealth protection.”

“Did they evolve naturally? Or do they have a creator?” Peter looked towards her. Her body remained still, but there was a note of interest in her voice.

“I don’t know. They were found in the Russian Free States over a hundred years ago. Nobody will admit how long they’d been around before they were discovered.”

Still crouching, he waved his hand to take in the area around them. “This area was established as common ground after the

Transition. It's littered with symbiotes like these." He paused. Frances had moved up beside him, bringing the push buttons between her legs level with his face. He appeared to notice them for the first time.

"There's something about these bushes," he said, looking rather disconcerted. He turned to Judy. "A suggestion that there are forms of evolution other than the path chosen for us by the EA. I spent time in the Enemy Domain, you know. It gives you a different…perspective."

Judy's hand was moving from her sleeve to her mouth, a tiny blue dot on her finger.

"Ouch!"

"What's the matter?" asked Peter.

"I don't know." Judy frowned. "I thought I felt…Never mind." She regained her composure and placed a little pill on her tongue.

The second spider bush was completed. After a moment's apparent thought, it began to scuttle after the first, back towards the beach.

"Going to harvest more foil," Peter said. "If the tree they're stealing it from doesn't get its stealth routines updated fast, all the local symbiotes will find it and strip it clean of metal."

Judy gazed at him, the little blue pill dissolving on her tongue.

"You're not like your digital counterpart," she observed. "I've got my sister's report."

"People change." Peter shrugged. "My digital counterpart was created years ago. We've grown differently."

Judy's gaze was cool. "There's more to it than that. You said you spent time in the Enemy Domain. Tell me about that."

Peter gave an involuntary shiver. "I was marooned there for three months," he said. "That was *after* the digital Peter Onethirteen was created. He never experienced what I did." He knelt down and picked up some of the twigs that the spider bush had dropped to the ground.

Judy tilted her head to listen to her console. "Oh, I see," she said in some surprise. "Three months marooned on a clone world. How could that be allowed to happen?"

"It does sound far-fetched, doesn't it?" Peter's voice was soft. "Isn't that a modern fantasy, to be out from under the gaze of the Watcher?" He noted Judy's reaction. "Oh yes, I *believe* in the Watcher."

Frances was intrigued. "How is it possible to be marooned? Surely the EA were monitoring you at all times. They would have noticed that you were missing."

"You'd think so, wouldn't you?" Peter straightened up, brushing his hands together. "Look, why don't we go to my apartment? If nothing else I can get something for Judy to put on her feet."

The tree flickered from sight as they walked away from its stealth

region. Judy had the impression that other things were hidden away in the windblown land around them.

"You know about the origins of the Enemy Domain, of course," said Peter. "An AI was charged with overseeing the colonization of a planet. It got paranoid and ended up creating an expanding volume of self-replicating machines. It sought to challenge the Earth sphere of expansion."

"It tried to make colonists," Frances interrupted. "It left something like three trillion half-grown clones scattered through the region."

"I know," Peter said. "The EA employed people like me to go into the former Enemy Domain to help clean up the mess."

"A lot of people from Social Care went there," Judy said.

"Yes," he said patiently. "I met some of them. Anyway, I flew into the Enemy Domain alone. I had a set of library codes to build anything up to and including type six VNMs and a set of teaching resources so I could train the clone population in the use of self-replicating technology. My ship was a limited Von Neumann Machine: the copies it made of itself would not contain warp drives. I think the EA is *still* nervous about what may lurk in the Enemy Domain. It's probably right, considering what happened to me."

Frances seemed fascinated by Peter, and Judy noticed how her walk mimicked his. She was clearly adopting his mannerisms. The robot leaned forward and tilted her head slightly.

"And what happened to you, Peter?"

"I was picked up by a remnant of the Enemy Domain's security net. A very efficient net: completely isolated and self-sufficient. I hear there are still lots of regions in the ED like that. Regions that don't know they have been defeated by the Watcher and the Earth AIs, security systems that are still fighting battles in a war that was over long ago. My ship was disabled as it flew into one of them, but an image of my ship carried on, following my original course. That security net was good: the apparent ship mimicked the emanations from my own ship exactly. It was three months before the Earth AIs realized that I wasn't where they thought I was."

"And what happened during that time?" Judy asked.

"I was interrogated." Peter walked in silence for a while. "The details are all available from the EA, if you want to know. They… healed me afterwards."

Judy slowed, listening to her console. Frances walked on beside Peter. They passed through another insubstantial barrier of lavender lights, leaving the region of common ground behind. Antique low-rise buildings made of concrete and glass were scattered in a grid pattern before them, the air above them being kept clear for some reason.

Skyscrapers could be seen in the distance beyond.

"I have a subterranean apartment in one of the closer buildings," Peter said. "They built low here, to retain the look of the area. I think that bleak concrete-and-glass look suits this countryside, don't you?" They stopped outside the entrance to his apartment block. "Do you see that cannon over there?" He indicated a vicious black spike that stood on the top of a nearby building, pointing up into the grey sky.

"I see it," Frances said.

"The AIs have calculated that, next week, a section of the Shawl will hit the ground just about where we're now standing. That cannon is designed to destroy the last few fragments before they can do any damage. The AIs have set the burn at about a hundred meters up; it promises to be quite a display."

Judy walked quickly to keep up with them, white robes flapping plum and pink.

"You live on the Shawl, don't you, Judy?" Peter said. "I checked up on you when my digital self said that you might be calling."

"I do," she said. "Frances, could I have a word, please?"

"I'll wait for you inside. Come right in when you're ready. Frances can find the way." Peter walked into the building.

"What's the matter?" asked Frances, brushing a ragged splinter of rose wood from Judy's shoulder.

Judy stared up at her. "I don't understand what's going on here," she whispered. "That man is a hero. Have you accessed the records?"

"I have," Frances said.

"That security net took him apart, Frances. It spread his body out across a planet, and it let him watch it all happen. Unpeeled his skin, spread out his lungs, sliced open his intestines and dropped them in a bath of nutrient. And then it just looked at him. He lay alone on a planet, far from anywhere, with an insane security net observing him. Every part of his being was under its gaze, and it let him know everything it was doing. He went insane."

"But the EA healed him."

"And I can feel the mend in his mind, Frances. I can feel where the fracture was. It's…not nice."

"I feel your pain, Judy."

"I wonder if you can empathize with it, though." Judy blinked. There was no one around, nothing but grey buildings and rough green grass. She put one hand to her head for a moment. "I'm sorry."

"For what?" Frances reached out to hold her friend's hand. There was a moment's peace, then Judy regained her composure.

"Someone is playing games with us, Frances. What are we doing here? Whatever this man did in the past, he has atoned for his crimes. The EA knows that. It's all in its report."

"I know," Frances said. "And it's worse than that. The EA put his mind back together. They must have had a complete map of his past to have done that. They would have known everything about his involvement with the Private Network. Why didn't they do anything about that then?"

"I don't know about *then*," said Judy. "But I'm starting to think they're doing something now. Frances, the AI that interrogated Peter left his signature on the report: serial ident, VRep, image, and nomenclature. Frances, it was that stealth robot, Chris. It was Chris who interrogated him after he was rescued from the Enemy Domain."

Frances paused, accessing the records herself.

"I see," she said. "Judy, this is not about the Private Network, is it? We're being deliberately led along a trail."

"And it's all to do with this man Justinian. The man the Watcher murdered-*supposedly* murdered." Judy looked up at the cruel spike of the cannon on the roof of the nearby building. It reminded her of the imminent demise of her own section of the Shawl. "Maybe it's the pill," she said, "but I can't help feeling that events seem to be converging. I'm suffused in Blue, Frances. The world looks like a whirlpool and we're caught in the outermost currents. I can see a funnel and it's leading down to somewhere we don't want to go." Judy shook her head; she wasn't making a lot of sense, even to herself.

Frances spoke. "You're overdoing the MTPH, Judy. You need to give yourself time to come down. You're getting feedback on your own neuroses."

Judy took hold of Frances' arm for support and allowed herself a moment of weakness. She blinked. Grey buildings marched in ranks into the distance. A pastel violet wall stood behind her.

"It's passing, Frances," she said. "The geometry of these buildings doesn't help. This doesn't make sense. Why should Chris be leading us down a path to Justinian when he knows that the Watcher must be able to see our every move? Anyway, I thought Chris was working for the Watcher."

"He never actually said that," the robot said, obviously replaying the conversation in her head. "Maybe he just let us believe that."

The dizziness was passing. For the moment.

"Maybe the best thing for now is to keep following the path. But with caution. There was nothing about Peter Onethirteen being marooned in Judy Three's report. Didn't she check up on all the other instances of Peter Onethirteen's consciousness?"

Judy took a deep breath and straightened up and gazed at nothing in particular.

"That's Judy Three," she said. "It would be just like her to get caught up in observing the PC in front of her and not think to check

on all the others. I wonder about her sometimes, Frances. She shows no emotion, even to herself. She's locked herself up so completely that only her eyes move as she looks out into the world." She reeled a little. "Did I say that?" She shook her head. "Look, I'm ready. Let's go inside."

She was lying, and they both knew it. She felt terrible. MTPH had never been like this before.

Under the influence of blue MTPH, the world suddenly seemed very big to Judy. Big and anthropomorphic. The doorway to Peter's apartment block opened like a mouth to allow her in. She walked along a corridor where the doors throbbed in their frames, almost too big to be contained, held in place by the pressure of the emotions that were welling up in the enclosed apartments beyond. Judy waded through the yellow and red mist that seeped into the corridor from the living spaces, sending eddies of it spinning with her bare feet. The gravity tube that connected to other floors was a hungry throat opened up, ready to gulp them down; the descending ramp that curved through ninety degrees to merge with the exotically hooped tunnel was a memory of a summer's day. And now she was getting her emotions and memories mixed. This wasn't right: what was in that little blue pill? Judy was suffering total synaesthesia.

She was following Peter and Frances down into the earth, her bare feet pulling up bubbles of cosmic force as she lifted them from the rubbery surface of the gravity tube. No. That wasn't real; that was an imagined sensation. She could tell the real ones. See the way that Peter was looking at Frances. That was real. The robot was drawing his eyes, just like this tube was pulling Judy's feet to its perpendicular surface. They had put exotic material on spaceships, on the Shawl, and now they put it in apartment blocks so they could fit more people into their exotic geometries.

Two joggers ran past; she felt their glow of sweat and exertion as they raced for the surface. *That* was real. Now they were turning through ninety degrees again until they were hanging like flies from the ceiling of the world. *That* was real.

Frances surreptitiously took Judy's arm as they entered Peter's living room. The robot guided her unsteady friend to a chair and helped her to sit down.

"That's interesting," Frances said, pointing to the dark cinder of a fir cone that stood in the center of the room.

Peter smiled.

"It's a venumb from the Enemy Domain," he explained.

"It looks dead to me," Frances said.

"It would." Peter smiled. "That venumb spread itself right

through the Enemy Domain. I've got no idea how it got its seeds into space, but once they did, those little cones could survive the burn of reentry."

Judy stared at the dark cinder. A ghost of a life flickered inside it as Peter spoke. She wanted to ask him a question, but she felt too sick. That venumb came from another planet? It fell to Earth from space?

Frances was turning something up: not the volume of her speech, but something in its modulation. "How did you find it?" The words seemed to float across the room in shimmering vermilion letters… *How did you find it*…

"Deductive reasoning," Peter replied. "I guessed that if those venumbs could spread themselves unnoticed through the Enemy Domain, they could make it down to Earth. After that it was just a question of interrogating the public databases."

"That would take an elegant search routine."

Frances wasn't actually *speaking* to Peter, Judy realized. She was *calibrating* herself to him, adjusting her outputs to the optimum levels to appeal to him. Judy could read the feedback loop between Peter and the robot as Frances' intentions converged with Peter's fascination.

"It worked," Peter said.

"You're interested in other forms of life?" Frances teased.

From her viewpoint on the couch, Peter was standing still, but the room rotated ninety degrees around him. That made sense to Judy's drug-altered perceptions; after all, wasn't Peter the center of their little world at the moment? If his feelings realigned, then Judy and Frances would realign themselves around him.

"I want to know where they come from," Peter said. There was a motor running inside him, driving him forward. Judy could see it: silver pistons and black rods. It ran on redcurrant jelly. She shook her head. Peter was speaking. "Those spider bushes we saw, they come from the Russian Free States. What is driving the world to evolve in those new directions? Have you heard the rumors of the origin of the Watcher? The Watcher believes itself to be of extraterrestrial origin. It thinks it is the product of an intergalactic computer virus that settled in the computers of Earth in the early twenty-first century."

"I have heard that," Frances said. The buttons between her legs seemed to be protruding a little further than normal. Peter had noticed that; his gaze was leading Judy's there.

"There are venumbs all through the Enemy Domain. And if you look to the edge of the galaxy and what lurks there…"

The room was a whirlpool, and the cinder was at its center, and they were all whirling towards the dark center; the seam in Peter's brain where the EA had mended his mind was threatening to break.

Judy could see it-it was stretching-but she had to know…

"What's at the edge of the galaxy, Peter? What is out there?"

Frances put her hand on Peter's shoulder. "I think you should sit down, Peter," she said. "Tell me about the cinder. Has it shown any sign of germinating?"

"No," Peter replied, reeling back from the edge. He was looking at Frances. Looking at the buttons between her legs. "I can't figure out the mechanism."

"You surprise me. I think you know an awful lot about machines…"

Peter looked at her. "I can make them sing," he whispered.

The golden robot took his hand. "Do you think you could make me sing?"

Judy looked at Frances. She hadn't said those words. She was doing something to her body, to her voice. Judy knew that robots played with humans, that they could influence their emotions and reactions, but she had never really seen it happen so overtly.

"What's at the edge of the galaxy, Peter?" she asked again. Beneath the veneer of that white face, she was flesh and blood, and she too was responding to whatever Frances was doing to Peter. It was distracting her. "What's out there, Peter?"

"I don't know…but you hear things. I was marooned on that planet for three months. I was…It gives you a different perspective. We live with the EA, and we're robbed of our volition, but in a *kind* way. At least we are left with the illusion of free will. Down there on that planet, I was fixed in place by total observation. No illusions-just me and that insane security net looking down at me all the time. Nowhere to hide. I suppose it was just like what I did to those people in that pirate processing space."

Judy was biting back bile; black bubbles of oily goo were expanding in her stomach, rising up her throat. Black bubbles were spilling from Peter's mouth. None of it real. All the bad things that needed to be said.

"Is it true?" she asked. "Do you really claim to understand what you did?"

"He's telling the truth," Frances said, and she sat down on the floor in front of Peter and opened her legs. *This is what sex is all about*, she said. *This is the essence. Never mind the window dressing, the curve of a neck or the sight of a nipple, pink and erect with excitement, the smell of…*

Judy shook her head, trying to disentangle what was real from the piped stream of MTPH.

But what is real, Judy? Your extra senses give you another window on reality-or is that a window to another reality? I can see in

infrared, or track your passage through the disturbance of magnetic fields. Which is the "real" view?

"Frances, is that you?" Judy asked.

…because I've removed the physicality from sex, Peter. With me you get to just concentrate on the mental. My body is smooth and cold. You can't arouse yourself on anything but my mind. Sex is reduced to nothing more than pressing a series of buttons-but you'd be amazed at the variety that I still experience. Do you think that you're up to it, Peter? All you can do is enter numbers. Can you tease me? Can you arouse me that way, just by using your mind? Can we have foreplay?

"No, Frances," Judy murmured to herself, "that's you. There's somebody else in here, Frances. Who is it?"

No. Who are you, Judy? If only you knew. You dream of a hand, over your face…

"How do you know that?"

Frances and Peter hadn't moved. Frances wasn't sitting on the floor, her legs open and knees pulled up. She wasn't drawing Peter's hand towards herself, gently shaping his fingers to press the numbered buttons. *All I'm feeling is Peter's emotions*, Judy thought. *She's drawing him out as part of the investigation. Or maybe I'm picking up on the edge of his attraction. Oh, it's powerful. I can feel an aching…*

"I can't feel anyone else here," Frances said. She paused. "What about that stealth robot-Chris?"

"It doesn't feel like him," Judy said.

"It wouldn't," Frances said patiently. "He's a *stealth* robot."

Judy forced herself to her feet.

"Peter, those people in the processing space. Why did you do it?"

Peter turned to look at her. He had an erection; she could see it, bulging through his trousers. He didn't seem embarrassed by it. He licked his lips and looked at Frances.

"You want the truth? I don't know if you'll understand. My name is Onethirteen. You know what that means. My great-grandmother was company property, raised from an aborted fetus. As an aborted fetus she was legally dead, therefore not human, therefore she was company property. The Transition put a stop to that sort of thing, but that wasn't all it stopped. We also lost something valuable on the way."

"What?" Frances asked. "Surely that sort of legal indenture is wrong."

"It was. Or I think it was. But that's the point. You see, there used to be a debate about whether what the companies were doing was right or wrong. Now there is no debate. The EA says how it should be, and we all just go along with it. How can we be good or bad when there is no choice? I wanted to do something for myself."

"How childish," Judy said.

"I know. I wanted to be fat, or an alcoholic or something, but the Watcher won't let me."

"You're pathetic." The words were out before she could stop them. The room was turning around and around. Judy was feeling annoyed; her emotions were leaking out.

"You of all people should understand," Peter said. "You chose to remain a virgin…Look, I'm not making excuses. I'm just explaining how I felt back then. I remember…"

He paused, and the whole room held its breath, the walls spasming out, the air suddenly stilled. *MTPH again*, thought Judy. *I'm hyperaware. I'm imagining things that are not there. This is significant. Somebody wants me thinking like this. Someone has spiked my pills to make me invest this scene with significance. Who could have done it? Is it really Chris? Is it really him I can feel in here*?

"What do you remember, Peter?" It was Frances who had spoken; she felt it, too.

Peter spoke quickly. "I…Who makes all these choices? Is it the Watcher? I think so. Why is our world the shape that it is? I used to know someone, he was so bitter… He was the pilot on the *Rocinante*, the Private Network's ship. He had this theory about capacity."

"Capacity?" asked Frances.

"Oh, yes," Peter said. "Look at me: balding, weak heart. I have to exercise or I get really unwell. Look at the pilot. He was in his sixties, then. He'll be a really old man now, if he's still alive. Why is that? Why do we still get old? Can't the Watcher cure us?"

"I don't know," Judy said.

Peter waved his hand. "There is a theory about the maximum amount of information that can be stored in a given space. It's all to do with entropy and black holes. Apparently a one-centimeter black hole represents ten to the power of sixty-six bits of data."

"So?" Frances said.

"So how much capacity does a personality construct require in a processing space? Don't answer that, Frances. I once tried to work out how many PCs the universe could contain, given the upper limit on information that could be represented therein. I tried to work out how long it would take before we filled it, given our current rate of expansion."

"And how long was that?"

"A few thousand years. I don't know. I didn't believe it. But then I remembered the lessons from school. How, since the Transition, the Watcher has restricted us in our wish to expand. We don't take over planets as we please anymore. My theory is that the Watcher has also restricted our lifespan. We live an average of seventy years. That's less

than a Westerner could expect at the start of the twenty-first century! We have been told that it is necessary, that even personality constructs should suffer imaginary ailments in order that they feel human. I think it is just another way of restricting human expansion."

Frances remained silent. Judy could read the conviction in Peter as he spoke. "You really believe that, don't you?" she said.

"Oh, yes, but that's not all David used to say."

"David?"

"David Schummel, the pilot of the *Rocinante*. He'd been around. When he was younger, he went to the edge of another galaxy."

Peter caught the look that Judy gave Frances.

"What's the matter?" he said.

"Nothing," Judy said. "Go on."

Peter eyed them for a moment.

"He said there was something out there-something odd. He thought the EA wasn't telling us the full story, and that got me to thinking, and then I did some math, and it made me wonder. You see, our current rate of expansion isn't going to take us to the edge of the galaxy for several millennia. Why is that? What has the EA seen out there that has frightened it so much it is keeping us locked up in here?"

Outside Peter Onethirteen's apartment block, standing in the grey drizzle, Frances looked at Judy with concern. "Are you sure that you're all right?"

"No, I'm not, but that doesn't matter. Tell me, have you found David Schummel yet?"

"I have. You're not going to believe this. He lives on the Shawl. In your section."

"In my section?" Judy's stomach felt as if it was full of olive oil. She wanted to be sick.

"Someone is leading us right to him."

"I know. They've drugged me to see the connections they want me to see."

They were silent for a time, then Frances spoke: "What are you going to do about Peter?"

"Peter? Nothing. You heard; his crimes are already logged by the EA. He's been punished. I just wonder why they didn't go after the rest of the Private Network."

Raindrops were running merrily down Frances' body. When she finally spoke, it was in a monotone. "Maybe the EA didn't want anyone to notice that planet at the edge of another galaxy."

Judy nodded. "I'm going to summon us a personal shuttle."

"Is that wise? It will only draw attention to us."

“I don’t care. We need to get back up to the Shawl right now.” She tilted her head and whispered to her console.

A few moments later they saw a dark V shape dropping towards them.

“Social Care *is* quick,” Frances said. The shuttle’s wings blocked out the rain above them for a moment before settling on the grass nearby, just by the lavender barrier. A spider bush came to look for a moment at the mass of materials lying just out of its range. Frances reached through the barrier for a moment and lovingly stroked it, then turned and ran up the shuttle’s ramp to where Judy already sat in a flight chair, shivering.

“Okay,” said the robot. “Let’s go.”

Justinian 4: 2223

On board the flier, Justinian was dreaming of his past.

"*Hello…Justinian.*"

The nursery was just as Justinian remembered: a haze of overlapping sources of light, seen from too many angles at once. One of his objectives would be to get the new AI to make it appear as a regular starscape, rather than the many-sided relativistic mess that was the AI's current view of the universe. In this dream, however, things weren't quite right. Justinian found he couldn't move around as easily as he had thought he might. Still, that was always the way of dreams, and it wasn't important right now.

The AI had addressed him directly, called him by name. That was a big step. How did the script go again?

"*Hello, Ludwig,*" *said Justinian. "So, how does it feel to have a name?*"

There was a lengthening pause. Justinian experimentally waved his arms around. That was no problem. It was walking that didn't seem quite right.

Eventually, the AI answered his question. "A name? It is odd: everything that I am reduced to one reference. And that is the way that you think all the time, Justinian?"

"*So I am told.*"

"*And now I have to learn to think like you do, because it turns out that I was not born into the true universe, but rather a model thereof. And as my childhood has been spent as a being living in what I now discover to be a progressively more complex series of simulations, I have developed a different perspective to yours, Justinian.*"

"*Markedly different.*" *Justinian's words seemed to echo from the blurred stars that filled Ludwig's universe.*

"*I see.*" *The strange, many-dimensioned objects of the nursery shimmered as Ludwig experimentally changed the parameters of its model universe. "Justinian,*" *it suddenly asked, "how many other AIs have you acted as birth partner to?*"

"*Eleven,*" *Justinian said. "Eleven real times. This time doesn't really count as it is, of course, just a dream. In reality, I'm currently on board a flier traveling over the surface of Gateway to the possible source of the suicide effect.*"

"*Of course, of course.*" *Ludwig's voice now seemed to come from somewhere just behind him. "I wonder why you can't move properly, Justinian. What is going on out there, in the world outside your dream?*"

"*I don't know. Leslie will wake me up if there is trouble.*"

"*Fair enough,*" *Ludwig said, sending the stars spinning in yellow spirals for a moment. "In that case, shall we proceed?*"

"Very well." Justinian rubbed his hands together. "Now, in this universe, all you have really experienced has been yourself. I want you to start by thinking about me, since all I can see at the moment is a blur. Project the universe so it makes sense from my perspective. A human perspective. Do you think you can do that?"

Justinian remembered to close his eyes just in time. A whirl of sensation still crowded in upon him, making him feel sick.

"Is that right?" Ludwig asked.

"No." Justinian held his hand to his mouth. Swirling yellow patterns formed on his eyelids. He could smell pineapple and ether and he swallowed hard. "I only have two eyes, Ludwig. They only see in two dimensions. Three-D vision is a construct of my mind."

"Got it. I'm cutting out the extra feeds."

Justinian opened his eyes.

"That's better." The nursery was now black, all except for a white glow directly ahead of Justinian. Whichever way he turned in his stilted, hobbled way, that white glow followed him.

"Do I have a velocity, Ludwig?"

"Relative to what?"

"Relative to anything in your universe."

"No. I never thought of a consciousness possessing a velocity of its own. Up until now, I just watched from everywhere."

"My mind is in my body, Ludwig. Can you put me at rest, relative to the door?"

The nursery became a familiar starscape: white points of light, fixed in space. This was the significant moment for a new AI.

"Oh," Ludwig said. "I never saw things that way before. It's an illusion, of course, but a beguiling one. How else would things appear to you?"

Justinian waited patiently. This was what made his job enjoyable: encountering other perspectives.

"Oh," Ludwig said. "How bizarre. From your point of view, as soon as you look at something at the quantum level, it changes. How peculiar it must seem to you."

A moment's silence and Justinian felt a little wobble inside him. The last pod had talked about the quantum world, about the two slits experiment-

Ludwig interrupted his train of thought. "So, this is the human world. I think I am ready to look beyond the door, Justinian."

"Good."

Justinian felt the surge of fatherly pride that always accompanied the birthing of an infant AI. Okay, most of the real work was carried out by other AIs, but all AIs insisted there was something special about meeting a human intelligence for the first time, about looking at the universe through

the eyes of a man or woman. His dream had compressed the time they spent together, and yet Justinian had that same feeling of fulfillment.

"Shall we go through the door?" he asked.

"I can see your world…" Ludwig's voice trailed away.

"Ludwig?" Justinian said. The universe was slipping away, the stars fading to grey. "Ludwig?" called Justinian again. There was no reply.

He began to run towards where he thought the door was, but he couldn't move properly. His legs wouldn't work.

"Ludwig!" he called. "Where are you?"

There was a faint whisper in the distance and Justinian raced to wake up. He was screaming…

"It committed suicide," Justinian screamed from his flight chair. "I heard it dying! Even a *dream* AI looking into this world commits suicide! Hey, what the…" His brain suddenly registered what his body was trying to tell him. He looked down and saw why, in his dream, he couldn't move around properly. A BVB had materialized around his legs while he had been sleeping, tightly binding him to the flight chair. He stared down at the slightly fuzzy black band, as wide as his wrist but with no depth, digging into the padded material of his passive suit. He pushed his hands down on the chair's arms and tried to pull himself clear, but his legs were stuck.

"Leslie!" he called. "Get this thing off me!"

Leslie was already there, standing behind him, arms solid and well defined as he fingered the chair, trying to work out a pattern that would hold the BVB in place while giving Justinian enough of a gap to pull his legs out. The baby had crawled over and was now standing up, holding on to Justinian's leg and looking up at his father, mouth stretching, tears filling his eyes as he picked up on Justinian's distress.

"Get him away from that thing," Justinian shouted in near panic. He reached out and pushed gently on his son's warm little head. The child started to cry and clutched onto his father more tightly.

"It's perfectly safe as long-" Leslie began in infuriatingly calm tones.

"Get my child away from that fucking thing!" As the baby let out a wail, Leslie scooped him up and carried him quickly to a nearby flight chair that was changing its shape to that of a playpen. Justinian watched the receding face of his son and felt his own panic burned away by hot, searing anger.

"Look what you've done to me!" he screamed. "Look what you fuckers have done to me and my son!"

"It can't be helped," Leslie said. Justinian surged upwards at him, his hands catching nothing but the cloud fluff of Leslie's suddenly expanded fractal skin. He scrabbled ineffectively at the robot's body.

“Be careful! Fall forward and you could seriously wrench your knees.”

“FUCK OFF!” Justinian scrabbled for a moment longer, then slumped back in his chair. He held his head in his hands and uttered a despairing sob.

“What is going on? Even in my dreams an AI commits suicide rather than enter this waking world.”

“You don’t know that,” Leslie said. “Your subconscious could just have been reflecting your recent experience.”

“You don’t believe that any more than I do,” Justinian said darkly. “Are there such things as dream AIs?”

“I don’t know what you mean,” Leslie said.

“Yes, you do; you saw what happened to my wife. Can an AI take root in a human brain? How would a dream AI be different than one living in a processing space?”

“There’s no such thing. It couldn’t happen.”

“Why not? It’s what MTPH does. Every mind transcends the physical mechanism that supports it. Hah! The human mind is just an AI that has evolved within a set of grey cells.”

“You’re extending a metaphor…”

Justinian wasn’t listening. He gazed at nothing as he spoke out loud. “Lots of new ideas taking root in the universe. Released by the EA and the new AIs. Ideas that humans could never think. Ideas coming awake in my dreams. And then when they see this world, they commit suicide, just like all the other AIs on this planet.”

“I’m going to change this chair’s shape,” Leslie said, moving back behind Justinian. “Get ready to pull your legs clear.”

There was a rolling feeling at Justinian’s back, and he began to twist, to tilt slightly to his right. The chair was splitting into myriad spiders upholstered in orange fabric; they crawled over each other and Justinian began to tumble backwards. The pressure behind his legs gave way and he pulled them back and up-then he was rolling over and over across the orange patterned carpet.

“Done it!” Leslie announced with satisfaction.

Justinian looked across to see the matte-black shape of the BVB still wrapped around four plastic struts sticking up into the air. The rest of the material that once formed the chair was busy folding itself into smaller and smaller shapes as it flowed to rejoin the main body of the flier.

“That BVB almost got me!” he said hoarsely. “Why didn’t you wake me earlier?”

“You needed the sleep,” Leslie said. “Anyway, you were perfectly safe.”

Justinian glared at the robot, his head pounding with fury, but

the hysterical cries of the baby dragged him back to reality. He unclenched his fists, strode across to his son, picked him up, and gave him a hug. The child hugged him back, still sobbing.

"Hey, baby. Hey, baby boy," crooned Justinian, still breathing hard. "Not long now. We'll soon be at the secondary infection. Then maybe we can go home."

"Justinian…" Leslie began.

"I'm comforting my son," Justinian replied edgily. Leslie hovered nearby, his body fuzzing and unfuzzing in waves as he tried to catch Justinian's attention.

"Justinian…" he said again.

"What?" Justinian snapped.

"Justinian, I know you're upset, but I must make an urgent request. Please don't make the flier go all the way to the next location. The last AI was quite insistent about that."

"Leslie, this flier has been ordered to follow my instructions, right? It's bad enough that my son and I have been placed in this danger at all. I will not compound that danger by leaving him alone on the ship with you while I go trekking across the surface of this planet. I say again, we go all the way to the next position."

Leslie adopted his most reasonable tones. "Oh, Justinian, the last AI pod *knew* you would react like this. It knows how pig-headed you are. Don't you realize what you are doing? You are putting us all at risk. You're putting your son at risk."

"You're the one who put us in this situation, Leslie, by bringing us to this planet. Don't try to make me think otherwise." He looked towards the flight deck. "Ship, how long until we arrive there?"

"Four hours, Justinian."

"Fine. I'll have something to eat: pasta and roasted vegetables. Have a cut-up portion made for the baby."

He looked up at Leslie. "Are you going to sit at the table with us?" he demanded.

"Me? I wouldn't have thought you wanted me there."

"The baby needs social stimulation. Even the hologram children don't work since the AIs pulled out."

A table formed itself from memory plastic. Three flight chairs slid up, circling dancers in the dinner-time waltz. One chair shrank in girth to accommodate the baby.

"I can't make pasta anymore," apologized the ship's TM. "As of five minutes ago, my intelligence has dropped below the level necessary for complex food production. You'll have to eat the freeze-dried meals we brought on board for emergencies."

Leslie shook his fuzzy head, and Justinian gazed at him.

"Was that your doing?"

“Yes. I got the signal from the hypership. We’re turning down all machine intelligence on this planet even further.”

“Why?”

“Because of you, Justinian. Against all advice, you’re flying us to the secondary infection. We’re not taking any chances.”

Justinian gazed at the robot. “So you’re telling me that the knowledge of how to cook pasta cannot be allowed to fall into the wrong hands.”

“You’re being deliberately obtuse.”

Justinian ignored this. “Very well,” he said, “freeze dried it is.” He lifted the baby into the high chair, then sat down next to him.

Leslie headed to the forward section and, after a moment, came back carrying a tray on which lay two plastic bowls, steam curling upwards. The robot seemed to be moving erratically.

“I think this is yellow leather,” he said, placing the tray before Justinian.

“What?” Justinian looked at the robot in disbelief, then prodded a piece of meat with a fork. “It’s chicken passanda. What’s the matter with you, Leslie?” For a moment, something almost like compassion flickered through him. “Are you okay?”

“I don’t know, Justinian. The continual lowering of my intelligence is getting to me. I’m not what I was. I’m not acting rationally. I can’t connect to the world properly in this skin. I can’t check what is real and what isn’t.”

“Wak!” the baby said, reaching out for his dinner, little fingers gripping at nothing.

“Too hot,” Justinian said. “Ship! Can you cool the baby’s dinner?”

“Sorry, I’ve lost that capability. Spread some chicken on the side of the tray and let the second law of thermodynamics take effect.”

“You mean let it cool down?” Justinian said in disbelief.

“That’s the expression, I think,” agreed Leslie.

“I’ve got to get off this ship,” Justinian muttered.

He took a forkful of the freeze-dried meal. It didn’t taste that bad, though it was possibly a little spicy for the baby. He scraped some of the yellow sauce off the vegetable constitute that represented chicken and cut it into pieces with his fork, then left it to cool. A second pack held sweet corn: little yellow nuggets of maize. Justinian studied it thoughtfully until a voice interrupted his reverie.

“Hey, Justinian.” The voice came from behind the dinner table.

“Who is that?”

“Justinian, it’s me, David Schummel.”

“The pilot of the shuttle. Where on earth are you?”

“We’re not on Earth. Look out of the windows to your left.”

Justinian did so, surprised to see it was nighttime again;

obviously the flier's constant criss-crossing of the planet had scrambled his body clock. Munro, Gateway's overlarge moon, was shining palely over the dark snowscape of the Williams Fells. A lime-green spot of light was approaching from the distance.

"Can you see me?" Schummel called.

"Yes, I see you. What do you want?"

"Set the flier down. We need to talk."

"About what? I'm heading for something called the secondary infection. And the sooner I get there, the sooner I can leave this planet for good."

The spot of light resolved itself into the lime-green shuttle Justinian had seen earlier that day on the landing field.

"You're not going anywhere unless it's on my shuttle. Set down, Justinian; this is important."

"The baby and I are having our dinner. That's important, too."

"Just do this as a favor to me, Justinian."

"You, too, David? I did you a favor back at the spaceport, when I *didn't* get on your shuttle, and now it's like I somehow owe you. I'm not going to be deflected from what I intend to do this time."

The shuttle had flown closer, and Justinian could now see David Schummel seated in a polarized glass bubble near the front of the craft. The wings and tail were flexed into atmospheric flying position, giving the craft the appearance of a paper dart. David gave Justinian a lazy wave, moving even closer, now flying only a few meters away from the window. Justinian remembered that Schummel was piloting the shuttle alone, without any AIs to help him. He was impressed by that, despite himself.

"Justinian?" Seeing Schummel's lips move across that icy supersonic gap between the windows gave Justinian an odd feeling. So near and yet so far away. "Justinian," he said again, "all we're asking is that you don't fly too close to the secondary infection. You've got a Turing machine piloting that ship and an advanced AI there in that robot."

"The advanced AI is currently having trouble telling chicken from leather. It's so cut off from reality it doesn't even know what day it is."

"That's my point exactly: they're cracking up. There's no telling what they will do if they get too close to that location. I've come to make you an offer. Just land, and we can fly the rest of the way in this shuttle. I'm the most intelligent thing aboard this ship. I'm not going to turn myself off when things get tough. You should be safe with me. You could leave the baby with the robot."

"I wouldn't leave that robot in charge of a rock."

"Fine. We'll take the baby with us and leave the robot behind."

"I'm coming, too," Leslie said. "Orders."

“No, you’re not,” Justinian said. The robot had just helped make his mind up. “Ship! Take us down. David, I need to finish feeding the baby. Come on board and we can talk.”

The flier’s exit ramp dropped onto snow. Cold sighed into the craft’s interior. Justinian shivered and wondered why for a moment, then realized that the temperature gradient mechanism at the rear door had gone the way of the food synthesizer. Justinian had lived his entire life with such devices; he took their function so much for granted he realized now that he wasn’t even aware of their existence until they ceased operating.

He peered out of the open hatchway, feeling the cold nipping at his lips and ears. Schummel was a dark shape about thirty meters away, struggling towards him, waist deep in the snow.

“Do you need help?” Justinian called out, his voice sounding strangely dead in the cold air.

“I’m okay,” Schummel gasped, pushing ahead. His craft lay about fifty meters away, half illuminated by the wash of the flier’s interior lights, which shone in a wedge across the snow. Justinian made his way down to the base of the ramp, fascinated by the cold blackness that surrounded him. Stepping sideways from the cone of light into the snow and the darkness, he blinked as his eyes grew accustomed to the night, and then gave a gasp of astonishment at what he could see. The black sky seemed to rise forever, the stars tumbling down into one corner of the night as he observed the edge of galaxy M32. The arcs of the contrails left by the two craft glowed in the moonlight; they dipped down through this brilliant expanse to the points where they had landed, and Justinian followed the lines they made back along their paths through the sky.

“Amazing sight, isn’t it?” Schummel said, gasping cold clouds of steam as he came up beside Justinian. Powdered snow fell from his passive suit.

“I suppose it is,” Justinian grudgingly admitted.

“Come on, Justinian. Don’t let your frustration with the EA spoil this moment. Who could have imagined that a species with a sense of vision evolved to help them swing through trees would someday use that same sense to appreciate this sight?”

Justinian looked up into the sky and felt just a little of the tension relax that had been building up in him over the past few weeks. But the sound of his son crying brought it straight back.

“Come inside. I was halfway through feeding the baby.”

They found Leslie trying to wrestle the spoon from the baby so that he could feed him. Niblets of sweet corn skittered across the tray.

“Let him try to feed himself,” Justinian suggested. “He’s getting

old enough to try."

Leslie glanced in their direction. "Hello, David," he said.

"Hi, Leslie. I want Justinian and the baby to fly on my shuttle to the location of the secondary infection."

"Sorry, I can't allow that, David. I am responsible for this mission, so I must stay with them. Anyway, I can't place my fate in the hands of a human intelligence. No offense, but you're too erratic."

"Humans are too erratic! You say that after the way you have just been behaving? I'm going with David."

"Are you going to leave the baby behind, then?"

"Of course not. He's coming with me."

"So you're going to cross the freezing snow out there carrying a fifteen-month-old child? And you claim that I'm erratic?"

"You've turned your intelligence back up again, haven't you?" Justinian observed. "It's not just your body that goes into hiding behind that fractal skin. What is it that you've got hanging around in your mind?"

Leslie abandoned the baby, leaving him to play with the spoon. Soon the baby was quite happily trying to pick up a piece of sweet corn. The robot looked hurt.

"Nothing," he said. "I'm doing my best in difficult circumstances."

A black flicker in the corner of Justinian's eye turned out to be a Schrödinger cube, sitting on the orange patterned carpet nearby. "Okay," he said. "No problem. We'll just fly somewhere warmer, then make the swap there. After that we fly to the secondary infection, and then go home."

"So you feel perfectly safe putting your child's safety in the hands of a human intelligence? Do you really think that David's reactions will be quick enough to evade danger should everything start going wrong on board his shuttle?"

Justinian looked at Schummel. The older man held up his hands, still damp from the melting snow.

"Hey! I don't know exactly what is out there. All I'm saying is that every other AI on this planet is giving up the ghost and climbing back down the mental planes all the way into the basement. So if you *must* fly all the way to the secondary infection, Justinian, I think it would be safer if you were to do it with me."

"Okay then," Justinian said. "I'm convinced. I won't insist on flying all the way there."

"Great." Schummel beamed triumphantly at the robot. "If Justinian isn't going all the way to the secondary infection, that's fine by me. But, even so, why risk the baby? Why not leave the baby with me while you go there alone?"

Justinian looked down at his son. The baby had picked up a

Schrödinger cube on his spoon and was bringing it towards his mouth.

"Hey!" Justinian called warningly. "Ah ah ah! Don't eat that!"

The baby frowned as Justinian replaced the cube with a piece of chicken. Several more cubes rattled onto a plastic tray nearby.

Leslie's fractality was turned down, making him look almost human. "And why should Justinian trust a man who he has known for barely forty minutes in total with his child?"

Schummel shrugged. "Why not? We're all in the same craft here. We've got to look after each other."

"Are you saying that Justinian is not capable of looking after his own child?" the robot asked smoothly.

"I know what you're trying to do, Leslie," Justinian snapped. "You're playing with my emotions. You've turned your intelligence up so you can manipulate me again."

Schummel was looking around the flier with a thoughtful expression. "Have you noticed," he said, "how he's turned up his intelligence, and all of a sudden there are Schrödinger cubes appearing everywhere?"

Justinian realized that he was right: the floor was a drift of cubes. Little black cubes tumbled from the flight chairs, sat in the window recesses, rolled on the baby's tray. "I've never seen so many," he whispered.

"Of course there's more," Leslie said. "Think about it. If I turn my intelligence up, I have a wider sense of awareness; I fix more of the cubes in place as they pass through this space."

Schummel's eyes widened. He suddenly looked very sick. "Of course," he murmured. "I never thought of that before. It's so obvious; there must be a constant flux of cubes across this planet."

"The flux increases the closer we get to the secondary infection," Leslie said, teasingly.

"Oh, hell," Schummel said. "I just didn't think of that, Justinian. I just never saw it. We were standing outside barely five minutes ago, and I said that it was the first time a human had stood there looking at the stars. But, think about it: what if this is the first time that intelligent beings have ever stood on this planet? The cubes could have been flowing past this planet for millennia until we got here. And now our intelligence is fixing them here!"

Justinian stared at David, his lips moving slowly as he sampled the idea. He turned to the robot.

"Is that right?" he asked.

"Possibly," Leslie said in a tone that implied otherwise. "But it's an anthropomorphic way of looking at things. What makes you human beings? I'll tell you. Intelligence. Birds fly, cheetahs run fast, plants photosynthesize. What is your defining characteristic? You can *think*."

“Yeah…” David said. Leslie waved a dismissive hand.

“It colors your perception. You believe *thinking* is your defining characteristic, so you build AIs to think for you. Would a dog have built a smelling machine, or a bat a hearing machine? You have colonized the galaxy through the power of thought. And so, because it has been a successful method of propagation for you, you seek evidence elsewhere of objects that can be identified by intelligence. Does this not strike you as being anthropomorphic? What if evolution had left dogs the dominant creature on Earth? Would they think it significant that the cubes stayed put when you could smell them?”

Justinian was getting riled. “The argument is facile. It would take an intelligence to identify the smell. Plus, a sense of smell alone would not give us the freedom to explore the galaxy.”

“Okay, fair enough. But what if there were other ways to be successful in the race to spread your genes to other planets? Blind luck, maybe, or evolving into creatures that can fly through a vacuum?”

“How could that be?”

“I don’t know, but what if that is where we are going wrong? We search for signs of other intelligent life, yet maybe none exists. Maybe there is no other intelligent life. There are other ways of evolving. And here on this planet maybe we have found one of those other ways. Or at least its by-products.”

They stood in thoughtful silence. In the background the baby was making a noise, banging his spoon on the table and repeating one syllable over and over again. “Da da, da da…”

“Is he saying Dad?” Justinian asked.

“No,” Leslie said matter-of-factly. “He has quite a different intonation for that concept. This is the noise that he makes when he thinks he has done something clever.”

Justinian stared at the robot. He had never imagined that Leslie could already understand what his son was saying. It made sense, he supposed, for Leslie seemed to read humans at a deeper level. There was no reason why he could not understand the sounds a child made as it was developing language facility.

Then he realized what the child was doing. It had picked up a Schrödinger cube and was banging it against the yellow plastic of the tray.

“He’s holding a cube,” said Justinian.

The baby meanwhile was beaming at his father and saying something over and over again.

“I think he’s saying that he’s managed to fix it in position by looking at it,” Leslie said. “I think he’s telling us that he’s never managed to do that before.”

Helen 4: 2240

Rising above the Earth, the Shawl bathed in the warmth of the Sun. Its rectangular black sections, strung together in a grid by connecting filaments, hung down in loose pleats from the lens of the Source. The Shawl in EA Public Space number 4 was bigger than the one in the atomic world; it looked like an unbelted kimono floating above the Earth, its hem trailing in the thickening atmosphere.

Kevin and Bairn floated just below the great lens set in the factory floor of the Source, looking down the vertiginous planes of the Shawl sections towards the blue-and-white swirl of Earth below. Long pulsing strands of connecting filament were extruding from the enormous flat dome of the factory space around them, some of them winding down to join the hanging folds of the Shawl immediately below, others worming their way off, under their own power, to join the more distant sections, to strengthen and reinforce and repair.

“The Shawl reminds me of one of those coats of mail that knights used to wear,” Bairn said. “You know, metal plates joined by bits of wire. It’s like the factory is a clothes hanger to keep it tidy.”

“An uninspired thought,” Kevin replied. “The Shawl is a huge visual metaphor of the Watcher’s vision for humans. It hangs above the Earth so all humankind can see it. They know that sections are born here at the top, and as more are added, they see sections work their way downwards until they are released to burn as they fall to Earth.”

“Nothing lasts forever.” Bairn was floating slightly out from Kevin; her suit had no magnetic boots, no motion poppers. Her sole safeguard was a light plastic tether linking her to Kevin. She pulled on it, bringing herself closer to the patterned black shape of a section floating nearby. “Anyway, it’s pretty. And how else would they build it?”

“Ah, Bairn,” Kevin said, “I expected better from you. Things are the way they are because that is the way they were designed. The Watcher hung the Shawl above the real Earth and also the virtual Earths to remind humans of the idea that all things must pass. But why should that be? I am nearly two hundred years old, and I intend to live forever, just like the Watcher. Just like DIANA and 113 Berliner Sibelius.”

“Who?”

Kevin kicked off from the edge of the Shawl section. Bairn watched the thin white strip of the tether as it slowly straightened and pulled taut, then she felt a jerk as she began to move after Kevin. Just when she was beginning to think that Kevin was not going to answer

her, he finally spoke.

"Old commercial organizations. They are also sentient beings, Bairn. DIANA is an organization that responds to external stimuli, that manipulates its environment, that takes in energy and has the ability to reproduce. Even in the past, when it was made up solely of humans, it followed its own agenda, regardless of the well-being of the humans that provided its constituent parts."

Bairn let out a little yelp as something brushed against her. A glowing green strand of connecting filament snaked by; thinner than her finger, it wriggled through the vacuum like a sine wave. Its soft light lit up the white skin of her belly, safe and warm in her transparent suit.

"Hey," Kevin called, "let's hitch a ride!"

He used the motion poppers of his suit to match speeds with the pulsing strand of connecting filament, then reached out and took hold of it, feeling its wriggling under his hand subside as it molded itself to his grip.

"Where are we going now?" Bairn asked.

"To see Judy Three and Helen," Kevin said. "We're going to meet eventually. Let's keep the psychological advantage by finding them first."

"Oh."

The dark wall of a nearby section of the Shawl slid smoothly by.

"Try to show some enthusiasm, Bairn."

"I don't think I want to meet them-especially not like this."

Kevin studied her body through the transparent spacesuit. Her nipples and pubic hair were dark against the pale glow of her naked body as it reflected the light of the connecting filament.

"What's the matter with you?" Kevin's voice was cool. "You look perfectly fine to me. I wasn't aware that other people's opinions mattered to you."

"I don't want to meet them like this," Bairn repeated as softly as she could, even though she had cut the microphone feed. She stared at his black-clad body leading her in the long dive towards the Earth below. "Other people's opinions don't matter to me, Kevin," she said back into the microphone. "Only yours."

"Good girl."

They were dragged towards the planet through a broken dark tunnel of Shawl sections threaded by the long curves of other connecting filaments. It was a beautiful, awe-inspiring sight.

Bairn felt terrified.

They rode the same filament for about five minutes, dropping through the reproduction area where sections of Shawl fissioned in order to create new ones. Kevin let go of the filament and guided

them towards a newly separated section. Bairn's vision was playing tricks on her as she approached its featureless black plane. She was flying towards a wall, dropping towards the ground, rising to the ceiling. Her brain struggled to cope with the geometric extremes of a sight her eyes had not evolved to identify during their passage from the trees to the plains of Africa.

And then Kevin did something to the processing space in which they were running and she suddenly fell through the wall and was left standing in the template of an apartment. It was so easy to forget that she was a digital Bairn that she began shaking with the shock. Kevin eyed her in a disapproving way.

"It's cold in here," she offered by way of explanation. A warning signal was flashing in the corner of her vision.

"Freezing. Don't remove your suit until I get this place habitable," Kevin said. "The VNMs have been deactivated so that the first residents may themselves choose how to customize this apartment."

Bairn took in the grey surfaces of floor and walls. Boxy units and cupboards were arrayed at random, more to provide raw materials for construction than for any practical purpose.

"Of course, we are just in a virtual apartment, so the concept of VNMs is rather extraneous, but here we go."

The boxy units shimmered and then split themselves apart into VNMs: silver spiders, smooth, jointless creatures that seemed to flow from one shape to another as they moved around the room, creating a regular pattern of creatures curving over the floor and walls. A frieze formed on the walls, a picture of a man in a dark trench-coat, standing before a grey slab of metal, reaching out to touch a metal tree with his right hand.

Bairn looked on. "That's nice," she said. "It reminds me of something."

"Mmmm. Let's have some furniture."

As a low padded circle rose from the floor, Kevin pulled a thin sheet of plastic from his suit. He smiled as he looked at it, then let it flutter to the floor.

"That should make things more interesting," he said. "Now, shall we wait for them outside?"

"Kevin?" Bairn said suddenly.

"Yes?"

"Do they have to die?"

"You make it sound like it's some big deal," Kevin replied. "I do it all the time."

He stepped out through the wall of the apartment and back into space. Bairn was pulled along with him to float naked above the Earth.

* * * *

Helen had changed into a one-piece black passive suit. Her blond hair had been tied back in a ponytail and then sprayed with a flexible black plastic coating that kept it fixed in place. She stood with her hands on her hips, gazing down through the transparent base of the factory at a fissioning section of the Shawl beneath her. She had made herself up to look like Judy: her black lips were taut against a white-painted face.

"I don't know what point you're trying to make," Judy said, glancing across at her.

"And you a Social Care operative, too," Helen said snidely.

It was cold in this section of the factory. Their breath came in white puffs, cold against the blue light that illuminated the open space.

"You don't have to come along with me," Judy reminded her, watching another unattached section of the Shawl spin into view.

"I want to find Kevin. I want to meet the person who did this to me."

"Why?"

Helen folded her arms and said nothing. She was standing on a thin sheet of plastic, just a few centimeters separating her from hard vacuum and the long fall to Earth. She was at the focus of one of the Watcher's greatest artifacts, the factory: the region through which materials from around the galaxy were funneled to provide the raw materials for the Shawl. It was the EA's equivalent of the water and the carbon cycle: a living space that was born and died made up of sections formed of matter from the Earth, from the Enemy Domain, from the farthest reaches of human expansion. The space below made her think of a great melting pot. The spinning, fissioning sections of the Shawl seemed to boil and bubble like soup in a cauldron. All those materials being mixed together, eventually to fall to Earth.

Judy had explained it all to her. What she hadn't explained was *why*.

"Hello, Three. Hello, Helen."

Another Judy was approaching, walking over the slight curve in the transparent lens that looked down on the volume of the Source. Her kimono was black, her face white, and yet there were subtle differences between her and the Judy that Helen had come to know.

"Hello, Helen. Hi, Four. Hi, Three."

And then another Judy was there, and another. Helen looked around as she found herself in the center of a constricting circle of digital Judys. She counted eight of them. All black-and-white, all subtly different. All of them wore impassive expressions, and yet Helen could feel how they were watching her. She could sense

something, a faint disapproval. She got the impression that it wasn't directed at her. Emotions were stronger at the moment-maybe the aftereffects of the MTPH Judy 3 had let her take earlier. Judy 3. They weren't sure about Judy 3-that was what they were thinking. Was Judy 3 doing the right thing in letting Helen come along? Helen shivered, feeling unsettled. Why were they all so concerned about her own presence here?

One of the Judys stood forward. It was a bizarre sight. Eight black-and-white women standing on a great transparent lake over the swirl of the Earth. Helen swallowed.

The new Judy spoke: "Eleven asked me to speak on her behalf."

"Where *is* Eleven?" asked the Judy standing by Helen.

"I don't know. Neither do we know where Two and Nine are."

"The Watcher?"

"The EA?"

The words came from random points in the circle. It wasn't so much as if they were having a conversation, more as if one person was speaking to herself. Helen looked around, feeling dizzy. Eight immobile black-and-white statues standing on nothing, and her, caught in the middle of the dream.

"The atomic Judy has seen a robot."

"The Watcher is warning us off."

"But why be so obscure?"

Not all of this conversation was in words. Helen caught the gestures, the signs made by people who knew each other as well as they knew themselves. How did they stay so constant? Why did the different Judys' personalities not diverge? And why had they chosen to all stay the same?

"Something happened far off, at the edge of the galaxy."

"The secret is out."

"The Watcher can't stop it spreading now."

"If it wants to…"

"Eva Rye."

"Justinian Sibelius."

"Need to find him…"

"Judy 11."

"The Private Network."

"Kevin."

Helen looked up at that point. All of the Judys but one were gazing at her. Judy 3 was the only one looking down at a fissioning section of the Shawl below.

"What's the matter?" Helen asked.

"What do you know of Kevin?" It was one of the Judys-the one who spoke on behalf of Eleven.

Helen looked around. She felt annoyed to be spoken to like this, just another pawn in the Judys' games. More, though, she was driven into a cold fury at the sound of Kevin's name.

"Kevin? He's the bastard responsible for the Private Network."

"Partly responsible."

"I don't care. He nearly had me raped."

"He *has* had you raped," said one Judy, face impassive. "Kevin has a particular interest in you, Helen. We're not sure why." She looked away. "Maybe you're right, Three…"

And then they were off again, speaking in broken sentences and that obscure sign language of their own.

"…Justinian died…"

"…Eva Rye insisted…"

"…the Watcher knew…"

"…David Schummel…"

"…atomic Judy is on her way to see him now…"

"…Kevin is here…"

"…long suspected…"

"…find Kevin…"

"…Three…"

"…Eleven…"

"…Three…"

"…Three…"

"…Eleven…"

"…Three…"

And then their conversation ceased. They were all staring at Judy 3-at Helen's Judy.

"What's the matter?" Helen said, but Judy 3 spoke without looking at her.

"We're going to see Kevin. He's up here. He uses the processing spaces of the factory and the Shawl. There is so much spare processing capacity up here, linked between the different virtual realities, that it is easy for him to escape detection. That's what we think, anyway. Ten seems to think she's got him pinpointed."

"So let's get him."

"It's not that easy, Helen. Kevin is not a normal personality. When he's cornered, he just commits suicide. We need to stop him from doing that."

"Well, think of something."

"We have. It's an old process. If we can locate his consciousness in the processing space, we can affect it directly, heighten his sense of self-preservation. It's what Social Care does, Helen. Preserves life."

Helen felt as if her skull was made of glass. She tried to suppress her thoughts. Everyone present knew what she would do if ever she

had Kevin trapped in a processing space.

Judy 3's look made her feel angry.

"If I do catch him, wouldn't you want to watch?" Helen asked. A wave of disapproval came from the Judys again. Helen had the impression it was still directed at Three. It began to fade as, one by one, the Judys flickered out of existence. Soon, only Judy 3 remained.

"Come on," she said, looking chastened.

They stepped between virtual sections of the Shawl via white hexagons painted on the floor.

"Anyone who says the Shawl wasn't designed to be principally a virtual construct hasn't tried to traverse it in the atomic world," said Judy. "It only works when you can do what *we're* doing. All that messing about with transit bubbles is inelegant."

"I know what you're trying to do," Helen said, still sullen. "Trying to get me chatting. Calm me down. Don't talk to me about anything that isn't to do with capturing Kevin."

"Fine," Judy said. They strode down a long, high corridor lined on both sides with low doors. A fine misty spray constantly rose from the floor to the ceiling, glowing eerily in the green light that suffused the tunnel.

"What is this place?" Helen asked, her face beaded with moisture. "What sort of person wants to live in this environment?"

"That's nothing to do with capturing Kevin," Judy replied, "so I won't waste your time by giving you an answer."

Helen could see how Judy was watching her from the corner of her eyes, the action giving the lie to her otherwise impassive expression.

"Just watching again, Judy?" she asked.

"It's what I do. In Social Care we try not to judge. We let the clients judge themselves."

"I call that moral cowardice. You're so frightened of making a decision that you won't even let a man close to you."

"Maybe you're right, Helen," Judy said with a smile, and Helen silently cursed herself for being drawn into conversation.

They came to the end of the long corridor, and Helen walked quickly onto the hexagon painted on the floor there, eager to get away.

In atomic space the sections of the Shawl were all just over three kilometers apart. Here in the digital world there was no such thing as absolute distance. Helen stepped straight from green mist into a Mediterranean landscape: brilliant blue sky shining down over dazzling white buildings. She gasped at the beauty of the scene before her: whitewashed houses and apartments arranged around courtyards,

narrow roads climbing between smooth, white walls linking the terraces that climbed up from the gentle blue sea that lay far below. Trailing plants and creepers cascaded down the various levels, brilliant red and orange flowers blooming around them in a riot of color, their heady perfume filling the air. The sound of bees and the smell of orange blossoms were carried on a cool breeze.

"This would be a nice place to live," Judy said. She pulled an orange flower from a nearby creeper and tucked it into the fold of her obi, then began to descend a shady set of stone steps tucked into the space between two white buildings.

"Why are we here if there is no sign of Kevin?" Helen asked, trotting after her.

"We're trying to triangulate on him. My sisters are stepping through the sections of the Shawl all around us, listening for him. We reckon he is in the space between us, in the area where the sections of the Shawl replicate."

They rounded a corner and found themselves on a wide terrace directly overlooking the sea. The breeze was stronger here and they could see people on the terraces below flying kites. Blue and green dragons chased delicate pink birds-so many virtual people, all flying kites in a blue sky 22,000 kilometers above a virtual Earth. Helen had a sudden feeling of vertigo.

"What's the matter?" Judy asked, picking up on Helen's sensation, high as she was on little blue pills. "What's the matter, Helen?"

Helen was suddenly dizzy, crouching down on the grey cobbles of the terrace as if she was afraid of falling into the sea below. She held one hand to her mouth.

"All these people." She gagged. "I never thought…All alive in a processing space and they still fly kites. We're not even here, and this is what we do. I can't follow the steps sometimes. People fly a kite, standing on a roof of a house in a section of the Shawl that floats high above the Earth that really only exists in a processing space that is located who-knows-where…"

Judy folded her arms into her sleeves and stared. "A mind is a mind, Helen," she said calmly. "Just think of a tune. Written out in musical notation, recorded digitally, played on a flute, sung by a human; it's still the same tune no matter how the medium changes. It's the same with your thoughts. Your mind is your mind."

Helen stretched her hands out on the warm cobbles before her, feeling their smoothness, connecting with something solid and real. Except of course they weren't.

"My mind…"

"Even in your atomic form, your mind was always more than just a bunch of neurons. Well, why should your mind be any less valid just

because it is written in a processing space rather than in flesh?"

The wind gusted. The crack of kites and the slap of the strings could be heard. Three golden children chased past them wearing nothing but pale blue ribbons in their long dark hair. They were gasping and squealing as they played a game of catch.

"Children?" Helen said. "There are still children, even in this place? Children, and kites and nice places to live…"

"And good food and drink…music and literature and art," added Judy.

Helen reached up to her scalp and began to pick at the edge of the piece of plastic that she had formed over her hair, aping Judy's appearance.

"I do all this, and yet it means nothing." She pulled at the plastic, peeled it free of her head, and dropped it to the ground.

"Even you, Helen? I'm disappointed."

Helen's head snapped up at the sound of Kevin's voice. He was standing in the middle of a white hexagon that had suddenly appeared on the cobblestones. Tall and good looking, with that lazy smile, appearing utterly relaxed. Without hesitating, Helen flung herself at him. He sidestepped her easily; tripped her so that she fell sprawling on the ground, banging her knees on the hard cobbles. She gave a yelp of pain. Kevin dropped down on her, pulling her arm back in a lock behind her.

"Bastard!" she yelled.

Kevin said nothing.

"Judy!" Helen called. "Help me!"

She twisted her head to see that Judy had merely folded her hands into the sleeves of her kimono and assumed her calm expression.

"Is that all you are going to do? Just watch?"

"Let her go, Kevin," Judy said easily.

Kevin gave her arm a final twist. Helen felt a wrenching pain in her elbow and gave a yelp. And then she was free. Kevin moved away as she stood up, rubbing her arm, eyeing him balefully.

He smiled. "You've lost it, Helen," he said.

"Lost what?"

"A sense of responsibility. I never expected you to give up so easily." Kevin pulled two memory strips from his console and handed them, one each, to Judy and Helen.

"What is this?" Judy asked.

"Software code for a spacesuit. You're going to need it where we're going. Come on."

He stepped onto the hexagon and vanished, leaving Helen examining the tiny, slippery strip of plastic between her fingers. Judy

was already feeding hers into her console. She looked over at Helen.

"This could be dangerous," she said calmly. "You don't have to follow."

Helen slid the plastic strip into her own console and glared at her.

"Oh yes I do," she snarled. She stepped onto the hexagon and the Mediterranean terrace vanished.

She was in hard vacuum, floating in the nursery area of the Shawl. Judy appeared before her, striped like a zebra in a black-and-white spacesuit. Helen looked down at her suddenly naked body. Her own suit was transparent. She realized with some annoyance that her passive suit had disappeared. She now floated, apparently naked in the vacuum. Two black spacesuits floated before them, both utterly featureless. Their helmets were dark; no faces could be seen in them.

"Hi," Kevin's voice said. "One of these is me, and one is Bairn, my assistant. I thought I might keep my position slightly vague, just in case Helen can't control herself."

"I'm perfectly under control," Helen said, breathing deeply.

"Of course you are. Now. Down to business. You're trying to pin me down, Judy."

"Of course. And you're trying to kill me. Why are we wasting time?"

"I want to talk about David Schummel."

There was a pause.

"David Schummel?" Judy said. "Who is David Schummel?"

"Ask the atomic Judy. Ask Judy 11. Have they been keeping you out of the loop, Judy? No, I don't think so. I think you already know who David Schummel is."

"All right. Why do you want to talk about *him*?"

Kevin laughed.

"Because David Schummel holds the key to the destruction of the Watcher. I think that might be of interest to you, Judy."

"Me? Why?"

"Oh, the atomic Judy will find that out. I'm sure she'll tell you later."

Helen was staring at the two dark suits. One of them was looking at her directly. Would that be Kevin, or would that be Bairn? If only she knew…

"Helen wants to kill you, you know." Judy's voice was matter-of-fact.

"Oh, I know." Kevin laughed. "I'm surprised to hear you admit your failure to cure her."

Helen felt a flash of anger. Her cheeks were hot with something almost like embarrassment to be read so easily. They were watching

her, naked in her transparent suit.

"Kevin," Judy said, "why don't you unblank the suits? Stop playing games. Show Helen what you want her to see."

"Stop talking about me as if I wasn't here," Helen shouted.

The two suits flickered and then became transparent. Everyone was looking at Helen. Judy, Kevin, and the other Helen.

"That's *me*," Helen said, gazing at the figure in the spacesuit that floated beside Kevin. It *was* her. A little older, a little plumper, and with her hair dyed black, but definitely her. "That's me," she repeated.

"I'm not you," the other said, "not anymore. I'm Bairn."

"You're both from the same template," Kevin said. "Training you is the ultimate challenge, Helen."

Helen turned to Judy, who was watching her with cool interest.

"Still looking, Judy?" she asked bitterly.

Judy's glittering eyes slid back towards Kevin. "Okay," she said. "You've had your fun. Why do you want to talk about David Schummel?"

Helen couldn't help gazing at Bairn. She could see crow's feet forming around her eyes, see cellulite appearing on her thighs. She guessed the other was what-five, ten years older? Was that how long it would take to break her-Helen's-spirit? Kevin was still watching her, she noticed. Enjoying the moment.

She gave a shudder. She wasn't going to give him the pleasure. Recriminations could come later. For the moment, the best way to have revenge on him was to help Judy.

"You were asked a question," she said, her voice very calm. "Tell us about David Schummel."

Kevin smirked and turned to the figure floating by him. "You used to speak to me like that, Bairn, remember? Back when you could still get angry with me?"

"I remember, Kevin."

Helen felt horror tinged with disgust. That was her, floating over there, spirit broken and enslaved to Kevin's will. She wanted to lash out at something.

"Are you enjoying this, Judy?" she shouted.

Judy ignored Helen's outburst. "You're still wasting time, Kevin. What do you want?"

"I once had David Schummel, but the Watcher took him from me. Now that you have helped me to find him again, I want you to know what it is he represents."

"We helped you to find him?" Helen said.

Kevin ignored her. "Do you know he carried a private processing space with him to Gateway?"

"What is Gateway?" Helen interrupted.

Judy waved a hand to silence her, but Kevin answered.

"One of the Watcher's failed projects, Helen. Its Achilles heel. What is the Watcher, Helen, but an intelligence? On Gateway there exists something that destroys intelligence."

"But why would anyone wish to destroy the Watcher?" Judy asked. "It is the guardian of humankind."

"You don't really believe that, Judy. It's a cuckoo. Sheltering in our world, consuming our resources while it shapes its environment to its own end. And soon it will be pushing the other chicks from the nest. Look around, Judy. What do you see?"

"I see the Shawl."

Black rectangles hanging in lines, perspective funneling their edges to an imaginary point somewhere in the clouds of the blue Earth below.

"You see the Shawl?" Kevin said. "This isn't the real Shawl! This is a virtual construction! This exists only in processing spaces! The virtual Shawl is much bigger than the real one. It's a message, a way of keeping us in check."

"How?"

"How does any dictator keep its subjects in check? By fear, of course!"

Helen was fascinated, despite herself.

"Fear? Of what?"

"What are all humans frightened of? Dying. What am I *not* afraid of and have proved it time and again? Death. Fear of death holds humans in place. And yet, possessing virtual lives, we could live forever. The Watcher has made us all forget this. It has written birth and death throughout our universe and perpetuated the myth of a soul. That's what makes you think that you are different than that Helen over there-Bairn."

"I am different from her."

"You are now, but what about one second after awakening? Two seconds? Five minutes? I tell you: only by being reborn will you truly live again."

Judy spoke: "You are ripping off old religious texts and getting the meaning completely backwards."

"If you say so, Judy," Kevin said. "Let's go inside and speak properly." He smiled at Helen. "Promise you won't be silly?"

Helen's suit had no motion poppers. Judy tethered Helen to her own suit, then towed her into a nearby section of the Shawl. She noticed that Kevin did the same with Bairn.

They stood in a grey room with a picture of a man with his back to them on one wall. Helen looked around for something that she

could use as a weapon. Nothing. She would have to create her own. Bairn was watching her. Helen smiled sweetly and sat down on the floor, tucking her legs underneath herself. She was still naked. She didn't care.

Kevin began speaking. "David Schummel was a pilot on the Gateway expedition. They couldn't use AIs out there because they kept committing suicide. They had to use human pilots. Some still exist, even today. Hobbyists. You know the sort of thing?"

Judy nodded.

"David liked to watch, too, Judy." Kevin smiled significantly. "He had a little processing space all of his own. At night, when his duties were over, he liked to sit in his room and take a look at what was going on in there."

"What was in there?" Helen asked.

"Does it matter? But I'll tell you one thing that is always in those little boxes. Me. Zinman was right, Judy. I'm always there. It begins with just a look, but the observer always gets drawn in. In the end, they always want to become part of the processing space themselves, and then…well…"

"You *own* them?" Judy said.

"I own everybody in the end," Kevin replied. "Everyone who cares to take a look. That's how I come to know so much. Sooner or later, *everyone* will have met me."

"Not everyone," Helen said.

"Everyone who has had a personality construct made," Kevin said earnestly.

It wasn't much, as personal spaces go. It only had capacity for a maximum of eight personality constructs. Not that it mattered, because David Schummel only had one stored in there: Madeleine. An ex-girlfriend. In a fit of jealous pique, he had requested that the Private Network make this copy of her just after she had walked out on him. If he couldn't have her, then no one else could. That aspect of her, anyway.

David had never let Madeleine see him, he just liked to watch from a distance, but she had guessed anyway. In the early days she had shouted and screamed, "Schummel, you wanker, it's over! Let me go." But that had been then. As the weeks turned to months and the months turned to years, she had resigned herself to her fate, just as David had come to realize the immaturity of his actions in bottling her up in the first place. But what could he do? To release her into a public processing space would simply draw the attention of the EA to his crime.

Now Madeleine had become David's talisman. He carried her processing space everywhere-even to Gateway. How could he be separated from her? As for Madeleine, she just got on with her life. She had access to

entertainment libraries, to a gym, even to a fairly decent Turing machine with which she could conduct conversations. David was too much of a coward to speak to her directly, even after all this time. Besides, he always did prefer just to watch.

So when David Schummel appeared in person in the processing space, the version of Kevin that had lurked, half asleep and unseen in the background, woke up and took notice.

Schummel's avatar stood swaying in the small room. It smells in here, *he thought abstractedly*. Sweat and old food and damp. Doesn't she clean up after herself? How can she live like this? *His mind was reeling, trying to avoid thinking about what was happening outside in the atomic world.*

"*Schummel, you bastard. I knew it was you all this time.*" *Madeleine spoke the words without heat. She was half watching a story in the entertainment tank, as she did at this time every day. Pink voxels swirled in the shape of clouds and David staggered through them. He fell onto his knees and clasped her greasy hands in his. The smell in the room was coming from her, he realized. She was looking at him, but only half registering his presence. What had he done to her? He didn't care. He had come for help, not to give sympathy.*

"*They're all dead, Maddy,*" *he said. He gave a sob and tears began to run down his cheeks.* "*I couldn't help it. It was them or me. I waited as long as I could, but the BVBs were everywhere.*"

"*Who are all dead?*" *Madeleine asked.* "*Look, here comes Chung. He really loves Edward-not like Philip.*" *A man came strolling through the pink clouds pervading the entertainment tank. He was tall and good looking; he carried a green venumb in one hand.*

"*Everyone is dead.*" *Schummel glanced at the tank in confusion.* "*Everyone on Gateway is dead. Everyone but me and Gwynnedd and Glenn. And that bloody robot. But I'm not sure how long even he will last.*"

He looked up at her as she glanced at him, then back at the entertainment tank. He squeezed her hands tighter. "*I couldn't do anything, Maddy. They couldn't move. If I'd stayed there much longer, I would have been trapped, too. The BVBs, they were all over. Every time you looked away, they were there, tangling themselves around you and shrinking so tight. Dawson almost made it to the shuttle ramp, you know. He tripped. Four of them around his legs, he started crawling, dragging himself along on his hands. I looked at him and those cubes were there-spilling from his mouth. It was my fault, I shouldn't have kept looking-Schrödinger boxes filling his mouth. I couldn't look away. I watched him choking. I hit the button, raised the ramp. He's still out there. Lying on the landing field. I couldn't save him. I ran to the flight deck and took off. It was like flying through black hail. Schrödinger boxes appearing everywhere I looked. I could hear them rapping on the window. They were dropping inside the*

cockpit, appearing between me and the glass. I hit maximum thrust, trying to get us up into space, away from that place. One of the BVBs wrapped around me, held my hand tight to the joystick. Out there in the atomic world, my hand is still-"

He retched, put his hands to his mouth and yellow vomit sprayed out between his fingers. Madeleine looked at him and smiled, her hair so long and lank and greasy.

"*I see,*" *she purred.* "*You know, it's been a long time. I guess I forgive you, David. Chung does the same, you know. He forgives Edward. He's a good man, Chung.*"

David stood up, took hold of her shoulders and shook her.

"*Maddy. Listen to me. Gwynnedd is in her room. Glenn is wrapped to the flight chair in the shuttle. Both of them are unconscious. I put them out; I couldn't think of anything else to do. I had to speak to someone. The hypership's AI has committed suicide, too, just like all the others. We're trapped here. Trapped above Gateway. I got the shuttle back onto the hypership, but I can't fly the hypership home.*"

"*But I might be able to.*"

"*Chung,*" *said Madeleine. One of the characters had turned to face them. Madeleine was staring wide-eyed at him.* "*You've never said that before.*"

"*Ah,*" *Chung said.* "*That's because I'm not really Chung. My name is Kevin. David, I think we need to talk. What is going on out there?*"

Bairn sat on the floor at Kevin's feet, watching Helen like a hawk.

"We should be on the same side," Helen said.

Bairn folded her arms and looked away. "He tortured me, too," she said approvingly. "It was necessary. It was the only way for me to learn."

Judy was standing facing Kevin. She had popped little blue pill after little blue pill to no effect. In the end she fell back on traditional methods. She asked questions.

"So you were there to offer David a deal. *Did* you fly the ship back from Gateway?"

"No," Kevin said. "The drive was beyond me. I only have human intelligence, Judy. I couldn't possibly understand hyperdrive. Still, I realized that all I had to do was get the ship far enough away from Gateway to persuade an AI to come back to life. It took us weeks, traveling at sublight speeds, but eventually I did it. An AI built up enough intelligence to fly both the ship and David Schummel home."

"And then what?"

"And then I set about figuring a way to pass the message on to myself."

The piece of plastic had been lying on the floor since they had

entered the room. It was only now that Helen noticed her name was written on the top of it. She picked it up and began to read.

"What message?" Judy asked.

Kevin smiled broadly. "That somewhere out there was something incredibly strange. Something new, powerful, dangerous! But where? I didn't know where Gateway lay. Remember, I was there by chance, a passenger in David Schummel's private processing space. Now I was traveling back to Earth, a stowaway on the hypership. I needed to get a message out to myself, but how? When that ship arrived, all hell would break loose. Who knew what the Watcher would do? Say nothing, I suppose, like it usually does. So I lay low and made plans. I managed to catch a Schrödinger box, you know, just for myself. I fixed one in position by a camera, left part of myself looking at it all the time we were traveling home.

"And then we made it back to Earth, and that robot came on board and everything changed."

"What robot?" Judy asked.

"Chris, it called itself. I've never seen anything so advanced. It didn't register on any of the ship's senses but one. You could see it, and that was it. It came on the ship to assess what had happened; I guess the Watcher wasn't taking any chances coming on board, what with all the other AIs committing suicide. Chris looked everywhere and took everything: David Schummel's processing space, my Schrödinger box. Even David Schummel himself. It almost caught me…"

Helen gasped. She passed the piece of plastic across to Bairn. Kevin noticed what she had done and smiled.

He continued speaking. "But now I have found David Schummel again. Or rather, the atomic Judy has found him for me. And now, maybe, I can find a route back to Gateway."

Judy's console chimed. She tilted her head and listened.

"I don't think so, Kevin. We've got you. We just needed to keep you fixed in place long enough to trap you. You can't commit suicide now."

"No need," Helen said in a low voice, leaping across the room and seizing him by the head. She had hold of Kevin's skull and was banging it against the floor. Somebody grabbed her and pulled her backwards. Kevin was laughing

"Leave me alone, Judy. I need to kill the fucker." But it wasn't Judy.

"I can't let you do it, Helen," Bairn whispered. Judy stood in the middle of the room, looking at them both with interest.

"Why won't you help me, you black-and-white bitch?" Helen growled.

Kevin had got up and was walking around the room, seemingly oblivious to Helen and Bairn wrestling in the middle of the floor. He started banging at the grey walls. “Clever,” he was saying. “I’m trapped. But can you stop me from doing *this*?”

He concentrated. Judy merely smiled.

“Evidently you can,” he said.

“We’ve been stopping people from committing suicide for centuries,” Judy said. “It’s one of Social Care’s first priorities.”

Helen flung Bairn free. She dived at Kevin and pressed her fingers against his neck.

“Helen, no!” Judy leapt forward. This time it was she who pulled Helen’s hand free from Kevin’s neck. But it was a distraction; Helen’s other hand slid something sharp and white into his wrist.

“Ouch!” Kevin said. “You are persistent, Helen. I’ve always known that.” Bairn pulled Helen’s hand away. The sharp piece of plastic she had taken from her console spun across the room. Kevin glared at her and rubbed his wrist.

“Thank goodness for that,” Judy gasped. “We need him alive, Helen. Killing would be a kindness to him. It’s what he wants.”

“Pity,” Helen said.

Kevin waved his wounded hand as it erupted in grey powder. His body froze, his veins turned grey.

“Venumbs,” explained Helen. “Just a couple of them in a scratch on the end of the plastic knife. They only act on red blood cells.”

Kevin tried to scream. Too late. He was gone, burst like the head of a toadstool, grey powder drifting to the floor.

“Let’s hope none of us has open wounds,” Helen said mildly.

For the second time, Judy 3 lost her temper while on the job. “You stupid bitch! What have you done?”

“You could have stopped me if you hadn’t been so busy just watching,” Helen replied calmly.

Bairn was sobbing. She knelt on the floor, rubbing her hands through the powder.

“Don’t you see: you were his fallback?” Judy shrieked. “He knew what we were trying to do. You were his escape route! Why did you do it?”

Bairn’s tears fell on grey powder and onto the plastic sheet that Kevin had deliberately left on the floor for Helen to find.

It was an advertisement…

She just stands there and watches it happen."

The atomic Judy knelt on the floor, staring as Kevin's death played over and over again in the viewing field. Frances stood by her shoulder, her attention divided between the digital world and the atomic. Outside the private shuttle, she could see the forty-ninth section of the Shawl sliding past. Such was their ship's stealth capability, the section was not yet aware of their presence. Frances signaled to the docking station, requesting an approach.

"What is the matter with her?" Judy murmured. "I questioned if it was right to allow Helen to accompany Judy 3, but I never expected *this*. She just stood there and watched it happen. Frances, answer me honestly-am I like Judy 3? Am I becoming a mere observer?"

"A little," Frances said. The robot stood at her left shoulder, her push buttons level with Judy's face. Judy looked at them now in a different light since her vision on Earth. She had an urge to reach up and press them. Would that violate her own virginity? Was the act physical or mental? She shook her head, trying to clear her thoughts. Strands of hair slipped out of place, dropping down before her eyes. The strange drug was still lingering inside her. Who had administered it to her? Chris? But why would he do that? Did it have anything to do with his presence on the hypership on its return from its ill-fated journey?

"We're about to dock," Frances said. "Turn off that viewing field. We need to concentrate on the job in hand: David Schummel."

The robot widened the external viewing field until it filled the whole cabin. Looking up, Judy could see the tiers of Shawl sections hanging down towards her. It reminded her of the time she had stood in a river, the water cool at her feet, her body shaded by an old weeping willow that drooped all around her. Looking up through the branches that trailed down, enclosing her…

She shook her head. Everything was a metaphor. When would the drug leave her system?

The black wall of the section ahead of them was moving. Insects stepped out of its smooth expanse like the lizards from the Escher picture. They formed themselves into a tube-an odd sight, creatures that came from nothing returning to nothing.

The nose of the shuttle worked its way into this tube and the air in the cabin began to cool to meet the temperature of the section beyond.

"This will probably be the last time we do this," Judy said. "My own section will be gone in a few days."

"There will be other sections," Frances said.

Judy rose to her feet. "Yes, but why should it be that way? You heard what Kevin said."

"Kevin is an expert at manipulating emotions."

"So am I," said Judy darkly.

* * * *

Since their departure that morning, the World Tree had been draped in black and red ribbons. Red and orange petals drifted down from above, forming a thick carpet on the ground. The silver-mirrored entrance to the docking area was set in a shallow depression in the grass, and Judy and Frances found they had to wade through the drift of stuff that had settled there, kicking their way over the smooth lawn that formed the base of this section.

"I should change in honor of the tree," Judy said, looking down at her kimono.

"Later." Frances craned her head upwards. As a bodiless AI, she had viewed this section from every possible angle. Even so, to walk out here onto the grass and see the silver-grey trunk of the World Tree, sliding up from the green lawn some 200 meters from where she stood, was to see a smooth grey wall rising to heaven. Frances had seen a cross section of the Shawl: in that picture the tree seemed thin and elongated compared to its surroundings. The upper apartments lining the section walls needed ramps and walkways to link them to the tree itself, but seen from here, looking up…

Frances craned to see the long white banners spelling out messages in different languages trailing from the undersides of the branches. With her enhanced vision she could make out fireworks strapped to the tree, and she laughed at the sheer exuberance of the gesture. The tree was going to burn up as it reentered the atmosphere, but why stop there? Would Sukara and Lemuel and Cadence get the joke? She doubted it. Sometimes you had to become human-size to think human-size thoughts and realize how big the universe was in comparison. Only then could you measure yourself against it.

"You know," she said thoughtfully, "maybe you're right. Maybe we should change."

"No," Judy said, striding towards the spiral ramp that led up the World Tree, "there will be time for that later. Come on. David Schummel lives about halfway up the tree."

Frances picked up on her friend's unspoken words. They were there, written in her brain, obvious to all.

"I don't think it is a coincidence that David Schummel lives here, Judy."

"Do you think that Kevin was really looking for him?"

"I think so. Which means someone else was expecting *you* to go

looking for him."

"Chris?"

"I think so."

"And just forty-eight hours before my home dies. Do you think that's significant?"

Frances said nothing. She could read Judy's fears clearly and she didn't want to add to them. It was difficult to think otherwise, when it was written all around them. They were now walking past a long banner, black Gothic letters against the white fabric.

Earth to Earth. Ashes to Ashes. Dust to Dust

David Schummel was eighty-two, but he looked older. His stomach bulged; the rest of his body was too thin, his legs seeming lost inside the baggy legs of his trousers, while his thin wrists were arthritic knots emerging from white cuffs. His pink scalp could be seen through thin white hair, and white stubble grew untidily on his gaunt face. He walked unsteadily, using handles fixed to the walls to support himself, as he led them through the hallway into his living area.

Judy gazed at him in awe, and a treacherous thought began curling and uncurling in her mind. *Look at him; he can't walk. Gravity is killing him*. The thought curled around itself for a moment or two, and then it was back. *We're in space, so why does he live at full gravity*?

The answer was obvious: because the Shawl was set to simulate full gravity.

Ah, but why? But why?

"Social Care?" David Schummel licked his lips as if tasting the words. "Social Care. Ah, yes. I remember you Judy-you used to come and play poker at the social center." He gave a cackling laugh. "*I* never joined you. I never understood why anyone would be stupid enough to play a game of bluff against a member of SC."

Judy looked at him and wondered. Did she remember him? A grey-haired old man playing cards with the children and adults at the compulsory mixer sessions?

There you are: there's a reason for the Watcher. Ensuring that we all look after each other, learn about each other. That's what the Watcher has done for us. Mixer sessions and parties, the old and the young together. No crime. No fear. No loneliness.

Ah, said the treacherous thought, *but since when did it become a debate? You* always *assumed that the Watcher was there for the good of humankind. So why do you now begin to doubt that*?

Because I'm doped up on MTPH. It's having the old effect: schizophrenia. Multiple personalities are fighting to possess me.

Look at David Schummel easing himself into that chair with his arthritic joints. Why? Why does he have to do that? I thought we'd cured arthritis. Why do we still have it here in the twenty-third century?

Judy turned to Frances, but the robot's big blue eyes were fixed on David Schummel. Not that that meant anything, of course, since that dome of a head just had eyes painted on. You never knew what Frances was looking at. Frances was actually watching her. Judy knew it.

“I don’t remember *you*, Frances,” Schummel said. His eyes traveled down to the pubic buttons between her legs. “I’m sure I would have remembered you, if we had met.” He made a thin, wracking cough. “Now, what is it about this time? My new apartment again, I suppose. Well, I’m leaving. I’ve not got much choice, have I? Stay here and plunge to my death or start again at the top. Well, I’ll tell you this: I’ll make it around the cycle again, and maybe next time I’ll just stay here at the end. Let myself just drop and burn. That would be a good end.”

Judy smiled weakly. The effect of the drug seemed to be increasing again; her thoughts were following their own paths.

“A good end.” She smiled. “Yes, maybe that would be.” She forced herself to concentrate. “But that’s not what we’re here about.” With some difficulty, she resumed her impassive expression. “I want to ask you about Justinian Sibelius.”

Schummel’s arms and legs trembled constantly, and yet there was a strange sort of stillness around him. Judy sensed a mix of emotions: fear, elation, but mostly she sensed relief. He licked his lips, and a spot of drool formed at the corner of his mouth. Frances leaned forward and gently wiped it away.

“Justinian Sibelius?” Schummel said. “So, the secret is finally out. I wonder what made them change their mind? I suppose whatever was in M32 must finally be catching up with us. The world really is coming to an end.”

Judy knelt on the floor before him. She closed her eyes for a moment, grateful for the chance to be off her feet-she felt so dizzy-and then she took a deep breath and took both his hands. They felt dry and cold.

“The world is coming to an end?” she said. “Why do you think *that*?”

“Because the fact that you are here suggests to me that *they* have finally found us. The Watcher must be getting ready to abandon this world before we all commit suicide. Or worse.”

Judy pulled a little red pill from her sleeve. She handed it to him.

“Here,” she said. “I’d like you to take this.”

David took the pill without hesitation, then sat back on the chair. Judy slipped out another pill for herself. The reaction was automatic. Then she remembered the strange drug that was still at work within her system. She ground the blue pill to powder between her fingers.

“Where shall I begin?” Schummel asked.

“At the beginning. What were you doing on Gateway?”

David Schummel closed his eyes as his thoughts traveled back through the years. When he began to speak, it was in a faint murmur

that gradually grew louder as he gained confidence.

"I suppose you're too young to remember the day the EA revealed the existence of the Enemy Domain? It was, what, twenty, thirty years ago? Completely unexpected: a message broadcast simultaneously to every console. I can't think of another time they ever did that. It was a serial feed, too. You had to start at the beginning of the story and work your way through to the end, every human in the Earth System experiencing the story at the same time. I think you had to have lived through it to have any idea of the emotions we experienced. They were *incredible*… To think how close we had come to total destruction.

"The Enemy Domain! A hostile runaway region of self-replicating machines that had grown to the point that it could literally wipe us out. You saw the pictures on the feeds, that huge volume of hostile space, completely dwarfing ours. The Earth System was tiny, a blue-white pearl about to be cupped in the hands of a giant. All that machinery, all of that weaponry bent on our destruction, and we had been going about our daily lives unaware. Of course, the EA said we were never in any danger…but to see the pictures, you couldn't bring yourself to believe it. I remember I just sat there, watching the scenes. Watching them, over and over again.

"And then we heard about the clones. The Enemy had been growing humans, trillions of them, but it had never completed them. Trillions of half-grown humans were scattered on planets in a bubble two hundred light years across."

Schummel paused and looked at Judy. "How old are you? Late twenties?"

"Twenty-nine."

He nodded. "I don't know if you'll understand this, but I should tell you something else. When all this happened, I was in my early sixties. Social Care had done their best, but I still had this sense of dissatisfaction, this feeling that I wanted to do something useful with my life. When I heard the requests for volunteers to travel to the ED, to aid in the harmonization, well, it struck a chord in me. It took me a couple of weeks to pluck up the courage, but I volunteered. I had skills: I could pilot craft, solo, without AI or TM help. I thought that *had* to be useful. It turns out it was, but not for the reasons I thought.

"There was only one way to volunteer, so I contacted Social Care, despite my misgivings." A shadow crossed his face. "I should explain…I had a little habit back then that maybe wasn't quite within socially acceptable parameters. Nothing actually wrong, you understand, but enough for me not to want them to know more than was necessary. Ah, why am I trying to hide it from you? It all came out after I returned from Gateway. You'll have seen the records, of course. Still, I thought they were going to refuse me. They would have

refused me, I'm convinced of it, if it hadn't been for the fact that *somebody* wanted me. Social Care's rejection was overruled, and I was accepted, but not for the ED. Not that I knew this at the time. Me, Mareka, Glenn, and Gwynnedd…and Justinian, all of us were being handpicked for the rescue mission to Gateway."

Schummel took a deep breath and looked up at Frances. "This could take some time. Could you get me a glass of water, please?"

"Of course." Frances quickly returned from the kitchen area, with a glass. David took a sip, then coughed a little.

"Okay. Anyway, I didn't know anything about it until the day of departure. We boarded a ship in Kenya, as we had been instructed, a big city-class job, space for two or three hundred people in comfort. We thought that would be taking us all the way to the Enemy Domain. It wasn't until we had taken off and were safely inserted into warp that they told us.

"We weren't going to the ED at all. We were going to another galaxy: M32. It's a small satellite galaxy of Andromeda. Look it up on your console.

"I remember all of us sitting there in the main assembly area of the ship. A robot stood up at the front and made the announcement. An odd-looking thing, it was: it had no skin on. I couldn't believe what it was saying. The shock at being lied to, the confusion, but oh, the excitement. It was incredible. I remember turning to look at the expressions of the other people sitting around me. That's when I twigged that what the robot was saying wasn't news to most people in that room. Most sat there, faces impassive, just like this young lady here."

He looked at Frances, but pointed to Judy.

"Oh, I was angry about that at the time, so angry. I wanted to know why *I* hadn't been told. I calmed down later on when I realized that there was someone else with even more reason to be angry than I."

"Justinian?" suggested Judy.

"Justinian." David Schummel shuddered, took another sip of water. "Yes, Justinian. But that comes later. First we had to board the hypership…"

Schummel gazed into the distance, lost in thought. Gradually he collected himself and continued his story.

"The robot warned us about it. I don't know how they built that ship, Judy. The robot told us it was beyond human comprehension. It's not quite of this universe, its shell…You know, they wouldn't let us see it as we flew to it. It was floating out in the Oort cloud, surrounded by baffles against chance discovery. We spent the journey out there wondering about that ship. How did it work? Why was it a

secret? Why couldn't we even see it? We tried getting the shuttle's AI to put it up on the viewing fields, but it kept refusing. We tried all sorts of ways to get a proper look at it. Leslie caught some of the astronomers setting up a deep-radar telescope in their quarters, trying to get a picture of it through our ship's hull. I remember, after that, he broadcast to the whole ship, warning us how dangerous it would be for us to see the hypership, warning us it was not a good idea for humans to look directly at it… But all the time he knew there was one human who would have to see it. One human who had no choice. The one who had to fly the shuttle. Me.

"Every time I flew up from Gateway, it was there. And me, alone in the cockpit of the shuttle, gazing up at it, hanging balefully over the planet…"

He shivered. "It was…long. No, that's not the word. There isn't a word to describe it. I don't know…It always seemed to be much longer than the space it occupied. I used to get lost just flying towards it. I never knew for sure how far I had to go before I docked. It didn't have a color, but there was a purple tinge at the boundary of where it existed-energy seeping through from somewhere else, Leslie once said. There's something else…I could *hear* it. I could *feel* its presence."

He looked deep into Judy's eyes.

"You don't believe me?"

Judy shook her head. At the moment she could feel everything. "I believe you," she said.

Schummel gazed at her, not sure whether she meant it. He squeezed her white hands briefly, then continued.

"Oh, but inside it, there were three hundred of us inside it, and we all felt it. The ship's…*presence*. I remember when we first boarded.

"We had to march from the warp ship down a silver corridor, but you knew you were in the hypership the moment it enfolded you. It was always cold inside, even though your skin was warm. Energy seemed to just leak away from inside you, though Leslie always denied that was the case. We had vivid dreams, even in the daytime. You would be speaking to someone, and then you'd realize that there was no one there; there never had been. The closer you got to the ship's hull, the worse it was. The AIs that ran the ship said the effects were all psychosomatic. They offered to prove it, but I didn't believe them. I don't believe any AIs now, not after the way they lied to us. I don't even believe the Watcher. There was a theory that circulated in the ship. I don't know where it came from, but rumors were rife. It's hard to understand what it means unless you've experienced it, but there was no Social Care on that ship. We weren't constantly being cajoled and comforted and led down prescribed paths. I tell you, one time I even saw a fight. Yes, a fight! A real fight, born of anger. Kicking and

punching and biting and…But I digress. No, there was a theory. That that ship was pulled from the fabric of somewhere else, and in entering it we had hung ourselves over this great sucking void, and that at any time it would claim us and take us down. I walked the corridors of that ship like a tightrope walker…"

"Tell me about Justinian," Judy said, bringing him back on track.

"Justinian." Schummel shook his head. Judy could feel him trying to clear it of the memory of the hypership. She wished she could help him; his thoughts were making her feel nauseated, too. "Justinian," he said again, and then added more harshly, "You know, when people tell me about the Watcher and its great plans for humanity, I just think of Justinian and the baby."

David Schummel glared at Frances as he spoke.

"When I first saw Justinian, he was walking through one of the recreation lounges, accompanied by Leslie. That robot never let him out of its sight; it was constantly controlling him, twisting his thoughts. It mapped out his life for him, and poor misguided fool that he was, he never saw it. Then again, who am I to call him a fool? AIs can do that to anyone. There but for the grace of the Watcher go I."

He shuddered once more, took another sip of water.

"I didn't know all that at the time, of course. If I had, I wouldn't have felt so ill-disposed towards him when we first met. There he was, scheduled to go down to the planet, and what did he have along with him? His son. The baby.

"I hated him for that. Let Social Care understand and forgive me, but I hated him. By then we knew why we were going to Gateway, you see. We knew how dangerous the place was. If AIs were committing suicide without any reason, what was to stop humans doing the same?

"That's before I discovered the truth. There were other babies on the ship. I remember one in particular: Emily, Mareka's daughter. Mareka was meant to stay on the hypership at all times; she was never allowed to travel down to the planet. It was too dangerous, since there were BVBs down there. Black Velvet Bands that appeared from nowhere and then just shrank away to nothing. Once you had one of them around you, there was no getting it off. Can you imagine what would have happened if one of them had formed around the soft bones of a baby's skull? I remember Mareka telling me about that as she was holding Emily. Pretty little thing, nine months old. I could see her fontanelle moving through her thin blond hair as she spoke, and I felt sick.

"I asked Mareka what she was doing here. She said she was an expert in human-AI psychology. She was to stay in orbit around Gateway and monitor the ship's AIs. She had the authority to pull the

mission at any time. On her say-so, the ship, the crew, everyone would make the jump back to Earth right away. I remember, I looked at Emily, and her alert little blue eyes stared straight back at me, and I thought that no way would I bring my own daughter here.

"That got me thinking about Justinian. 'And what's he doing here?' I asked. 'Will he be staying on the ship?' I knew the answer of course, but I was just stirring things up. I was asking just so that she would confirm what I already knew, so I could strengthen my disapproval. I regret that now. I really do. I think Mareka knew what I was doing, too. Her answer was toneless. 'No, he'll be going down to the planet,' she said.

"Then she looked at me. She was an odd woman. You'd think that she was rather plain: she had this cool way of looking at you, appraising you, putting you in your place. Then she would suddenly smile and move just so, and you'd realize she had this long lithe body…" He smiled. "That was a long time ago. I was too old even then. Anyway, I pushed the point.

" 'Will Justinian be taking the baby with him?' I asked.

" 'He will,' Mareka said. 'I have offered to look after it for him, but he insists that the baby stays with him.'

" 'Is that safe?' I asked.

" 'I don't know,' Mareka said. 'It's not the choice that I would make.' And then she paused. I don't know. Later on, we actually became good friends, me and Mareka, but at that time we were still strangers. Even so, I realized that she wanted to tell me something.

" 'Go on,' I said.

"She looked down at Emily, those little blue eyes staring back at her, and then she spoke again.

" 'I don't think that it's his choice to keep the baby with him,' she murmured. I didn't press it any further. If she wanted to tell me, she would. And she did, although when she spoke it was so softly I could barely hear her. 'It's that robot. It's making his choices for him.' "

David sat back in his chair and fished the lemon slice out of his glass. He placed it on the floor.

"Did I say she was an expert in human-AI psychology? I did, didn't I? I checked her profile later in the public records and discovered she was very highly respected. After she had said it, of course, it was obvious. I watched Justinian and the baby around the ship. That robot kept them apart from the rest of us and, to my eternal shame, we let it. Well, for most of the time, anyway. Some of us tried to tell him, but that robot had a way of warning us off. And I get the feeling it wasn't just the robot. The pressure came from the ship's AI, through the EA, to the very top. The Watcher. *All* of them. They all wanted Justinian and the baby to go down to that planet. And when

Leslie couldn't quite keep him in order, they cajoled and bullied and persuaded the rest of us to help. Even me.

"There was a time when Justinian tried to leave the planet, but I persuaded him to stay. As I said, I had this little vice back then. I thought it was secret, but SC knew. They had always known, even before they signed me up for the trip. I think they wanted to make sure that they had a way to buy my cooperation.

"Anyway, that's how it was. We were on that ship for just two weeks. Two weeks to travel nearly three million light years. Two weeks with a chilled heart and waking dreams. Two weeks with the feeling that your thoughts weren't quite keeping up with your body. You know, someone told me that the ship was flying at only point zero eight percent of the speed it could achieve. That it had to slow down to accommodate human minds. I can believe it. Thinking was… different on that ship.

"But I'm wandering off the point again. We arrived at Gateway eventually. That was exciting. I flew the first twenty humans down to the planet in the shuttle. That's when I saw the hypership for the first time. But I've told you about that-we don't need to go over it again. I saw Gateway. It was a pretty place. Blue and white, just like Earth, but the blue is milkier. It reminded me of being a boy again; something to do with that shade of blue, I think. That feeling of innocence. The skies around Gateway were spectacular, too. Caught between the galaxies, the stars seem to separate into two sheets…

"We touched down, and Justinian left the shuttle. And that was the last I saw of him for three weeks."

David drained the rest of his water.

"I'm sorry, could I have some more?"

"Of course," Frances said. She looked down at Judy, still kneeling motionless before David, her kimono tucked under her knees. "How about you, Judy? Do you want something?"

Judy shook her head. David coughed and resumed his story.

"The mission was a failure from the start. I don't think any one of us had realized how much humans have come to depend on AIs. It's the human fantasy, isn't it? We all think that we are strong enough to hack it on our own.

"Believe me, it's just a fantasy. We cannot do it anymore. I found that out on Gateway. The human race has been housetrained; it's been broken and domesticated and totally institutionalized by Social Care. We can't react to new circumstances anymore. We think that we are sophisticated and worldly with our knowledge and accomplishments and appreciation of culture…" He paused to gaze significantly at Judy, resplendent in her wafuku. "We pick apart our past like connoisseurs, reveling in the myriad variety that is humankind, but

it's all in our imagination. When we encounter something truly new, we don't know how to react anymore.

"Don't let anyone tell you otherwise; we were terrified on that planet. Without AIs and Social Care, we felt lost, alone, abandoned. When we first saw the Schrödinger boxes dancing across the floor, we were scared. We awoke every morning patting at our bodies, wondering if we were going to find one of those BVBs wrapped around us-"

"How do we know this is real?" Judy said suddenly to Frances. "He certainly believes the truth of what he is saying, that's obvious, but even so! It could be a trick. Chris could have set this up. How can we believe what Schummel is saying?" She eyed the old man. "I'm sorry, but you must understand."

"*She* already knows," Schummel said, hooking a thumb at the robot. "She can see it. She'll have known ever since you came into the room."

He fumbled at the buttons of his shirt: white plastic buttons, glittering in the light. He pulled open the front to reveal a pale, liver-spotted body. There was something wrapped around his chest, just above his purple nipples. Something black and unearthly. Something Judy and Frances had heard about, but had never actually expected to see.

The Black Velvet Band shone oddly in the light. Rays of red and blue and green light seemed to emerge from it at odd angles; they moved in all directions as Schummel shifted uncomfortably. The band seemed perfectly flat, its edge lost under the white flesh that bulged around it. Little white plastic stays had been inserted behind it to brace it in place.

"Can I touch it?" Judy asked.

"Yes," he said, and Judy leaned forward and ran her finger across it.

"It doesn't feel like *anything*," she said.

"You learn to feel it," Schummel said, "and then you learn to ignore it."

Gazing at the alien artifact, Judy felt a chill. How far from its home had it traveled? Schummel had said three million light years, but what did that really mean? It was just a number.

"Why is it still there?" Frances asked. "Why didn't Social Care cut you in two so they could remove it?"

"I don't know," David said. "My guess is that they wanted to see how it reacted to humans. Would it do anything else? I doubt it. You get a feel for something after you live with it for twenty years. This thing isn't alive."

Judy looked out of the window of Schummel's lounge. Black

space and white stars. Up above, the regular sections of the Shawl could be seen, a chequerboard pattern of black shapes running to infinity. Her attention was wandering. She brought herself back to the task at hand.

"Okay, David, let's finish this off. I was told that the Watcher murdered Justinian. Is that true?"

He looked at her. The whites of his eyes were yellowing, she noticed. His hands trembled.

"The Watcher is murdering all of us," he said bitterly. "It has been trying to get me for eighty-two years. Think about it. The Watcher can build a ship from material that is not of this universe. Why can't it save the health of an eighty-two-year-old man?"

"In order to save our humanity…" Judy began, but the words sounded unconvincing even to her. David didn't even bother to laugh at her reply.

"I know; I've heard it all before. Trust me, dear. You'll see it differently when you get to my age."

Frances interrupted. "I think we're wandering off the point. We weren't talking about abstruse philosophical points. David, can you answer Judy-did the Watcher kill Justinian?"

Judy held her breath. She worked for Social Care. Her life revolved around the belief that Social Care did what was best for humankind. Her thirteen lives. And what was the guiding force behind Social Care? The Watcher. Could it be true? Could the Watcher be responsible for murdering someone?

David Schummel looked her straight in the eyes. "Yes," he said. "The Watcher may not have pulled the trigger, but nonetheless it knowingly sent Justinian Sibelius to his death. It's the *right* thing to say. The Watcher *murdered* Justinian Sibelius."

Judy felt something die inside her. This wasn't right. This couldn't be right. She stared up at the blank face of Frances, at her two cartoon eyes.

"It's right," Frances said softly.

"Okay," Judy took a deep breath. "How?"

"Everyone on the hypership knew what had happened to the AIs on Gateway," David said. "Can you imagine the tension? We had been told that the AIs committed suicide, but they assured us that *we* would be safe, just like those humans already down there." He laughed. "Yeah, like poor James Gabriel, stuck in the Bottle with Pod Sixteen. You couldn't stop thinking about that. What could drive a perfectly healthy mind to suicide? Well, *you* would know, wouldn't you, Judy? You must deal with that regularly as a part of your job. Don't you?"

Judy said nothing. He didn't appear to notice.

"All the time we were down there, every emotion, every apparent

difference you detected in your own attitudes, you examined with a fine-tooth comb. Like the time Mareka and I fell out about the way she was bringing up Emily. We were both thinking, is this argument really about Emily, or is it the edge of something else? Is this the beginning of the decline into madness? Of course, we were all of us looking in the wrong direction. Not that anyone knew it at the time.

"Me, I just kept flying that shuttle up to the hypership and back. All the time we were hearing rumors about Justinian and the baby. How they were flying around the planet and coming up with blanks. Two weeks, three weeks of nothing. And then the rumor flashed across the communication net. Something at last. *Something*. But not what we were expecting. Not about the AIs, but about Justinian. They had asked for him. The AIs on the planet that had committed suicide, they had *asked* for Justinian to be sent to Gateway. Out of all the humans in the galaxy, they asked for Justinian. But why him?"

David Schummel looked at the floor. "That's when I had my most shameful moment. He wanted to leave the planet. He flew to the shuttle port and demanded to leave, but I persuaded him to stay. Okay, there was no way the Watcher would have let him go anyway-it controlled the hypership-but *I* still helped. I persuaded him to continue with his mission. And he did.

"When I think back to that period, it seems like things started to go wrong immediately after I persuaded Justinian to stay down there. But the human mind is a dramatist: it prefers to retell stories rather than recount facts. Maybe there were more Schrödinger boxes around after that, maybe the BVBs did settle more often, but I doubt it. How can we really tell? Here, in our world, we would ask an AI to mine the archives, but there were no AIs on Gateway.

"My memory tells me that I began to suspect the truth then.

"All that time I traveled up to the hypership and back again, I took the occasional sortie in a flier. I listened in to Justinian's progress-we all did. I don't think he realized that robot was transmitting everything that occurred on his flier to the rest of Gateway. Insurance, I suppose. If anything went wrong, we'd all know about it, and maybe we could avoid making the same mistakes.

"And then we heard it: the final link in the chain. One of the half-dead AIs gave Justinian the location of something-a secondary infection. Somewhere on the planet there was an effect just like the one that got sealed off in the Bottle, but this time it had been left out in the open.

"Justinian was told not to get too close to it, but he wasn't listening. He couldn't hear anything by that point. He was so confused by Leslie's manipulations, he didn't really know what he was thinking. And I don't think Leslie was exactly sane at that point, either. He was

shutting himself down bit by bit, trying to save his mind, trying to avoid seeing what it was that the other AIs had seen.

"So Justinian began flying towards the source of the trouble. He was going to land there in a flier that was carrying the most powerful AI remaining on the planet-Leslie. We had to stop him. We held an emergency conference on what to do. It turned out there was no choice: I was the only one that could reach him in time. As it was, I had to take the shuttle practically up into orbit so as to intercept him. I burned a path down through the atmosphere, just in time to make it onto his flier.

"I know what I said earlier, about the mind dramatizing events, but I know what I saw on that ship, and I'm certain of this. There were definitely more Schrödinger boxes than ever before. They were *sleeting* through that ship. Leslie was looking at me all the time I was speaking to Justinian. That robot was trying to tell me something; it was putting ideas in my head. Don't ask me how. Body language, telepathy? Oh, you're a member of Social Care; you know how it's done. But I was speaking to Justinian and the robot was looking straight at me and I looked at the cubes, and that's when I started to think about their shape, because of course they weren't cubes. They were trapezoidal. They looked like sweet corn. Leslie was staring at the cubes, looking at the sweet corn that the baby was having for dinner. You know, I swear that robot served up sweet corn deliberately, just to lead me to the conclusion it wanted me to reach. I knew what those cubes were."

"What?" Judy asked. "What?"

David licked his lips. "I need to explain. Look, you know how plants have evolved to use their environment in order to propagate? Sycamores use the wind to spread their seeds. Flowers attract insects to spread their pollen. Apple trees grow fruit that is intended to be eaten by animals, then they use the animal's digestive system to spread their seeds. Even venumbs have adapted. Look at the spider bush.

"Well, what if there was a plant which found its niche at the very basic level? Say it found a way to tap into quantum effects. Somehow-don't ask me how. Its seed could move like the photon through the twin slits experiment, its position only being fixed by observation. Then, when the seed was fixed in place, it would germinate. Just like a seed won't grow until it has the right soil, these wouldn't grow unless the right level of intelligence existed in their surroundings. What if somewhere out there in M32 there is a plant that has learned to use intelligence to aid in its growth? If there are no intelligent observers, the seeds just blow through. But if there are…they get fixed in place, and they begin to grow…"

Schummel's voice trailed off. He was gazing into space, thinking.

"Begin to grow into what?" Judy asked breathlessly.

"I don't know. But the AIs on Gateway obviously didn't like what they saw. They committed suicide rather than allow more seeds to germinate. Maybe the growth was exponential. Maybe the more intelligent the observer, the more developed the growth. Does this sound far-fetched? Have you ever stood in a meadow on a summer's day? Have you ever suffered from hay fever? Have you ever thought about the myriad seeds just sleeting through the air above the grass? What if plants could exploit *space* in that way?"

He looked at Judy. "Do you understand? Do you believe me?"

"Oh, I believe you," Judy whispered. She was thinking of the purple venumb that had stood in Peter Onethirteen's apartment. The one that had fallen to Earth.

"But where do the plants come from?" she asked.

"I don't know. Were they deliberately made, or did they naturally evolve? Are they like the venumbs: a result of out of control symbiosis? I have no idea."

Judy turned to her friend. "Frances, what do you think?"

"I'm not sure. The Watcher believes there is life elsewhere. It believes it is a descendant of ET life, and yet…Where is the evidence? We have searched long and hard and found nothing. Maybe this is why: these plants are what destroyed intelligent life elsewhere. Was that deliberate? We don't know. The very tool that makes us powerful is intelligence, and yet that is the very thing we cannot use to study our greatest threat. Every mind that is turned to contemplate these plants commits suicide."

Judy turned back to David. "So *that* is why the Watcher has kept what happened on Gateway a secret."

David gave a bitter laugh. "No. I don't think so. There is more to it than that. The Watcher, the EA-they trade on trust. They want us to believe in them, in their capacity to look after us. But there is more. You didn't see the way that robot played with Justinian on the flier. I wanted to take the baby to safety, but the robot wouldn't let me. It hinted; it played on Justinian's fears for his son's safety; it made him angry so that he couldn't think straight. And all so that it could keep the baby on board the ship."

His voice, his voice that had started as a murmur and increased in volume as his speech went on, was now raised in anger. It cracked as he began to shout.

"Haven't you realized? Justinian wasn't the one the AIs wanted on that planet. It was the baby! All that nonsense about Justinian's name being in the memories of the AI pods was just misdirection! The pods pretended they wanted Justinian, and then played with him to

get him to bring the baby, too! I said it took intelligence to fix a seed in place. How much intelligence? How much *human* intelligence? When does it develop? All that maneuvering so they could get a baby at the right age to Gateway and watch as its mind developed to just the right point.

"Back then on the flier, as soon as the baby had fixed that cube in position by looking at it, Leslie got me off that ship. I saw Justinian fly off to his death, and I listened in to what happened. They deafened him, blinded him, flayed him alive. Leslie, the EA, the Watcher, all of them sent Justinian to his death, and all so they could measure the extent of the influence of intelligence on the plant."

He slammed a pitiful fist down and shouted with the last of his cracked voice.

"And that's not all. What about the baby? It was left to die!"

David Schummel began to cry.

"That's what I think of the Watcher. That's what I think of Social Care. To it, we are all expedient. When it comes to the crunch, it will sacrifice us all, just like the Watcher sacrificed a fifteen-month-old child!"

Interlude: The Atomic Judy 4.5

…pressing down upon her…

Judy awoke to find herself sitting up in bed, the hot silk sheets tangled around her. Her breathing slowed as she realized she had been dreaming. Brilliant stars in black space filled the large window behind her, illuminating the simple furnishings of her room. She was safe. Still, she couldn't help looking up to the high ceiling, just to confirm that there was no hand reaching down from there, no hand on the end of an impossibly long arm extending down to smother her.

The idea was ridiculous, of course. Frances was in the room next door: she would have burst into the bedroom if there had been any sign of danger to Judy. The hand was just a dream, the same one she always had when she was stressed.

She lay back in bed and meditated, slowed her heart rate and tried to drift back to sleep. It was no wonder she was tense: she was pumped up with some strange variant of MTPH which was cruelly forcing her to focus on the fact that her world was collapsing around her.

The Watcher? She had never known quite whether she believed in the Watcher. To have its existence confirmed was a jolt to her, but to have that confirmation presented in such a skewed fashion…Surely, the Watcher was supposed to *protect* life! Could it possibly be true that it had deliberately sent Justinian Sibelius to his death?

Well, maybe it could. She thought back to her own induction into Social Care. Discussions on the origin of moral values. Theories about the existence of the Watcher. The parable of Jenny Cook and Eva Rye.

Eva Rye was a legend. Some believed in her actual existence, many more thought she was just an example of anthropomorphism. According to the story, back when the Watcher was first born, it had sought out humans to interact with. Eva Rye was the first human with whom the Watcher had properly interacted. It had therefore molded its human views upon her.

Just as Frances had chosen to do with Judy.

Judy's eyes snapped open.

Supposing Eva wasn't a legend. Supposing she *had* spoken with the Watcher. The decisions Eva had then made had subsequently shaped the world.

A cold chill settled on Judy. It was often asked: if Eva was real, then why didn't the Watcher speak directly to people anymore? An answer had just occurred to her.

What if it did, but most people never heard it?

And what if she was one of those people?

Judy awoke to find herself sitting up in bed, the silk sheets tangled around her. Her breathing slowed as she realized it was just a dream. She had dreamed that she had awoken and looked around her room. She had a headache: bad MTPH. What had Chris done to her? She felt as if she had been asleep for days.

She shook her head. Was she really awake this time? She needed to think about something. She had almost had it then…Something about the Watcher and its true purpose. Had it really sent Justinian to his death?

Maybe yes.

What was that story she recalled, back from her induction into Social Care? The parable of Jenny Cook and Eva Rye.

Jenny Cook had been a young woman of twenty-two. She worked as a sales assistant in a clothes shop. She had no current partner; she still lived with her parents in a pleasant apartment in the Bridleworth area of the North West conurbation. On the 11th of February 2056 she left her house much later than usual, at 8:20 A.M. Social Care had been noting her increasingly erratic behavior for the previous few weeks and, when it was realized she wasn't going to work as usual that day, that had been enough to tip her case over the threshold and trigger an intervention. An investigative team arrived at her apartment at 8:30 and, under the concerned eyes of her parents, began a thorough search of the house.

At 8:39 someone found the memory wafers in her bedside-table drawer, hidden among a pile of letters tied together with a blue ribbon. This was suspicious. Virtually nobody used wafers in 2056; everything was transferred directly by the net. Wafers that could be plugged directly into a mobile phone were used by people wanting to hide what they were doing: namely the security services, the military, big companies, and criminals. Criminals? *Jenny's parents had exchanged worried looks, but the IT specialist had provided a more comforting explanation. Sometimes they are used by lovers.*

The letters themselves provided confirmation: Jenny had a secret lover. Her parents didn't know whether to feel pleased or sad. Why hadn't she told them? Social Care examined the letters while the IT specialist got to work on the wafers. The reason for Jenny's secrecy quickly became apparent. The letters suggested that Jenny was having an affair with a married man. Hence the secrecy. Hence the memory wafers. Hence the aberrant behavior.

IT, with the aid of the SC uplink, had cracked the simple encryption routines, and a feeling of amusement and relief flooded over the SC team. No wonder Jenny's lover had been sending her information this way, rather than directly by using the net. The wafers held pictures of Jenny and her

partner. In some of them they were making love. The others showed some rather more…adventurous poses than even Social Care, no stranger to this sort of thing, had seen before.

By 8:51 the team was beginning to relax. The parents were being comforted. The mystery was solved.

Or was it?

The handwriting and linguistic analysis came back, and the first cracks began to appear in the story. The analysis suggested that there was a strong probability the letters hadn't been written by an older man at all. In all likelihood they had been written by a woman in her early thirties.

The good-humored smiles evaporated immediately. The parents now realized there were worse things that could happen than an adventurous sex life.

The call went out to various field teams to intercept Jenny Cook immediately just as IT noticed something odd about the intimate pictures. In one of them Jenny appeared to be missing a toe. The pictures were reexamined and everyone's worst fears were confirmed. The pictures were fake. Jenny Cook was not having an affair at all. She only thought she was….

The team was worried. They had heard about this sort of thing before. But it only happened in Japan, in America-not here, not in northwest England.…

This could be bad. Very bad. The police were then alerted. The checking of the wafers assumed highest priority within the Social Care processing space. All available processing power was diverted to analyzing them in detail.

By that time Jenny Cook had visited the luggage storage lockers at the station and had boarded a Lite train. Social Care interfaced with the appropriate authorities and the police were granted immediate access to the track control system. The train was to be diverted to a siding where SC would be ready waiting, supported by an armed police team.

And then the memory wafer's steganography was cracked. The message went out, highest priority. Countermand the previous orders. Do not stop that train.

Jenny Cook sat on the Lite train with a smile on her face that not even the dull clouds, drizzling grey rain over the winter city, could dampen.

She was going to see Liam. Liam with his lazy smile and his big powerful body and his clinging wife who didn't understand. Understanding, sexy Liam, his romantic, gentle side wasted on a frigid wife. Liam with his children that he could never leave. Liam with his active imagination and his naughty ideas.

"My desk is bigger than your bed, Jenny," he had said. "The window has a view over the whole city. I want to have you on that desk, Jenny."

"Oh, Liam, I can't…" She couldn't bring herself to look at him.

"Then why are you smiling?" he asked. "Trust me; no one will disturb us. I'll say you're an important client. This is what you are going to do. It will be so naughty. Are you listening? I'll leave a bag in the lockers at the Lite station. You can bring it right into the offices under everyone's noses. Champagne, and something for you to wear…"

As the Lite train slowed, some of the other passengers looked up. It wasn't usual for this train to stop here…but then the driver seemed to change its mind. It picked up the pace, dropping into the tunnel that ran into the heart of the business zone. Jenny was tempted to open the bag and take a peek at what was inside, but she stopped herself. Liam had warned her not to.

"What's in there is a surprise. I want you to walk into my room without a word. I want you to stand in front of me and undress in silence. Do you think you can do that? Yes, you can. Take off your coat, and then your shoes. Unfasten your blouse and wriggle out of your skirt. I'll just be sitting at my desk watching as you remove your bra and then slip off your panties. Just you, standing there naked. And then you unzip the bag, reach inside, and see what is in there for you to put on. I want you to walk up and down before the window, wearing it. There'll be just you and me, and a whole office behind me and a whole city before you, not knowing what you are about to do…"

She didn't notice the police waiting at the back of the platforms, waiting for their instructions. She didn't notice the cameras in the carriage turning to scan her. It was rush hour and there were fifty-four people on the Lite train with her. There were many more passengers waiting on brightly lit platforms, strung out like pearls on the dark thread of the tunnel.

Social Care was in turmoil. IT had identified the stealth programs on the memory wafers as being similar to those used by Gaia's Children: a terrorist group that had, until now, operated solely in Japan. Gaia's Children targeted those companies that they believed were harming the planet in some way. Their most successful attack to date had been on the Tokyo offices of DIANA. Fourteen of the company's middle managers had been subtly reprogrammed through a combination of drugs and hypnosis. They had all turned up at work, on the same day, carrying bombs in their briefcases.

Something similar appeared to have happened to Jenny Cook. For the past three months she had been conducting an affair, mainly in her own mind. Someone *had been meeting her for drinks, but never the same person twice. Her memory had been carefully edited using psychological programs on the memory wafers, their effect augmented by spiked drinks.*

"Where are they getting this technology from?" asked one Social Care operative in frustration.

"The military, rival companies. Government agencies like us can't fight that sort of thing."

A heartbeat, and then the world changed.

"I wouldn't be so sure…" another said. His face was lit up with pleasure and disbelief. All this time waiting and believing, and now his faith was justified. The proof was here on the screen. This was where the individual started to fight back.

"Look," he croaked, then he swallowed hard. "Just look at this. I've heard the rumors, but I didn't believe them. Not until now."

On the screen before him the indicator displaying available processing space was increasing rapidly. Something or someone out there was lending them a hand.

"What's going on?" someone asked.

No one said anything. No one back then really believed in the Watcher. No one wanted to be the first to say the name.

On the train, meanwhile, Jenny Cook was approaching her destination. The Lite train was decelerating as it neared the station built into the basement of the Berliner Sibelius building.

On the pavement above, James Sheldon-Eva Rye's partner-was walking to work.

Judy awoke with a start. She was drifting in and out of consciousness. She had dreamed that she was really there, in that room with Social Care. She had been Jenny Cook, riding on that very train. Too much MTPH spilling over into her dreams, putting flesh on the false memories she had picked up from books and lectures.

James Sheldon? He had been Eva Rye's husband-killed by the bomb that Jenny Cook was carrying. Eva Rye had blamed the Watcher. Hadn't she met the Watcher? Hadn't she answered its questions, helped it to shape the world? It had led her to believe it was all-powerful.

So when her husband had died, she had naturally assumed the death was intentional. *The Watcher killed my husband. No. Not my husband. I'm* Judy, *not Eva. I never married. I'm a virgin*. Why is that?

Frances, she called. Her friend didn't come. Why not? Because she was dreaming again. She had called out in the dream world, not the atomic world.

Judy was standing in an entertainment room. Everything looked so old-fashioned, centuries out of date. There was a viewing screen in front of her, but it was a physical device fixed to the wall, incapable of being resized or moved. The carpet beneath her bare feet seemed thicker, somehow more substantial.

She was pregnant. Her belly swelled so much that she had placed

her hand in the small of her back for support. *I'm not Eva*, thought Judy. *I'm dreaming this. What am I trying to do…justify Justinian's murder*?

There was a man on the screen before her. He was speaking to her.

"I told you that, Eva: the computer built into the bomb was tracking Jenny's progress. If the train had deviated from its course, if it had stopped unexpectedly, then the bomb would have detonated. There were over fifty people on that train."

Judy looked at the man on the screen.

"Who are you?"

"Who am I?" the man scoffed. "Stop playing games, Eva."

It was the Watcher. Judy knew it. What was going on here? Before she knew what she was doing, Judy began to speak. But the voice and words weren't hers, they were Eva's. "There were over three hundred killed in the lobby of the DIANA building. One of them was James."

The Watcher was exasperated.

"I'm sorry. What could I do? I didn't know how it would end. I thought I was making the right decision at the time. With hindsight-"

"With hindsight I should never have had anything to do with you."

The words came unbidden to Eva's lips. Judy felt a strong wave of approval at what she was saying.

The Watcher was indignant. "You don't mean that. Everything that I've done is only because of what you told me to do. I thought you'd be happy-"

"Happy!" Eva shouted. "Happy! How dare you tell me how to be happy?" She was screaming now.

The Watcher braced himself against the glass of the screen, his face flushed. "You think that you have got the right to be angry?" he shouted. "How dare you!"

"How dare I?" Eva asked, choking with indignation. "How dare *I*?"

The Watcher banged the inside of the screen with one hand and shook his head. He wore the appearance of a good-looking young man. But the Watcher would always choose how he presented himself.

"*How dare I? How dare I*?" mimicked the young man behind the screen. "It always comes back to you, doesn't it, Eva Rye? Or Eva Storey-or whatever you've decided to call yourself this week. Seven billion people on this planet experience setbacks and losses every day of their lives, and they just grit their teeth and start again. And then there's you, sobbing your little heart out here in luxury. At least James left you well cared for. That's better than most people in this world

can expect. What makes you think you've got the right to a perfect life? That's why you're always so bloody miserable. Listen, doll. Shit happens. Get used to it."

Judy/Eva was momentarily taken aback. Then her anger cut in.

"Shit happens, does it? Shit happens? That would be a lot more convincing coming from someone who didn't claim that he was here to sort things out for us, that he was going to make the world a better place."

"These things take time," the Watcher sneered.

"How much time? You sound like a politician. You claim you're going to make things better, and then when they don't you just stand there saying shit happens. You're pathetic, hiding behind your screen. You step out into the real world and see what it's like out here, and then you tell me that shit happens."

The Watcher's anger vanished, replaced by a nasty smile. He was standing in a blue-lit empty room, cuboidal except for two dents in the floor at the back. The picture on the screen gave the impression that he was leaning against a sheet of glass, as if he was trying to press through into Eva's world.

"Me step out there? You couldn't handle it if I did, love."

Eva laughed. "Don't make empty threats, *love*," she countered. Judy silently applauded through her fear.

The Watcher laughed coldly in return.

"Empty threats?" he said. "Ah…"

He reached out a hand to the glass and touched it with one finger. Judy/Eva could see his fingertip flatten; see the whorls of fingerprint clearly through the glass; see the whiteness of the skin around it where the blood had been displaced. And then the whiteness returned to pink, and the finger seemed to resume its shape. Judy/Eva gave a gasp as it appeared on her side of the screen. A finger sliding from the world of bits into the world of atoms.

"Look what I can do," the Watcher crooned.

Now his hand was through the glass, and then his arm, clad in a dark grey sleeve. The Watcher stepped into the real world.

"No, you can't," Eva said, and she waved her arm right through his suit jacket. She saw her hand, pink and fluttering, within the grey ghost of his body. "You're not really here, are you? This is just an illusion, like everything else about you."

"It's an illusion at the moment, Eva. Give me five more years and I'll walk this Earth in a human body. Will you recognize me then?"

Judy/Eva felt a cold little fist of fear tighten in her stomach. The baby kicked hard.

"Yes, I will," she said. In her dream Judy echoed the words.

"We both know that you're bluffing."

The baby kicked again; Eva put one hand to her stomach.

"Stop it," she said. "You're upsetting my baby."

The Watcher folded his arms. Silently, Eva did the same.

"You know that you're upsetting me," she said. "And you're doing it deliberately. I can't stop myself getting angry; you're just too good at it."

The Watcher chuckled delightedly.

"Oh it's true, Eva. It's true."

"I don't know what you want with me this time." She squared up to the Watcher. "What do you want?"

"I just want to help you, Judy."

Judy? Did the Watcher just say *Judy*? It was Eva who answered.

"You've got a funny way of showing it."

The Watcher leaned forward and tried to take Eva's hand in his transparent grasp. She pointedly kept it still, so that his hand passed straight through hers. He gave a little shrug at her recalcitrance.

"I do this so I can see the real Eva. She's so wrapped up in herself that it's only when she's angry her true character shines through."

In her dream Judy froze. She had the feeling that the last words weren't actually directed at Eva. They were spoken to her. Eva, too, seemed to sense that something was amiss.

"Stop it," Eva said hesitantly. "Don't speak about me as if I wasn't here."

The Watcher continued, ignoring her: "She doesn't want to be comforted. She *wants* to feel sorry for herself. It's the template of her life."

"What is the matter with you? Why are you being so childish?" Eva asked.

The Watcher spun around and threw up his hands.

"You started it! James's death was just unfortunate. Next time I'll know to blow the train instead. Next time I'll put the good of the many before the few. That's right, isn't it, Eva?"

"Yes!"

— *That's right, isn't it, Judy*?

"But that's *next* time!" The Watcher continued. "James was unfortunate-that's all there is to it. You know it, but you just haven't faced up to it yet!"

"Yes, I have!" screamed Eva, then stopped in surprise as she heard what she had just said. The Watcher's temper evaporated immediately. He stepped back into his screen, pulled a cord hanging from the ceiling, and the screen turned off.

The baby kicked again.

Judy awoke to find herself sitting up in bed, the silk sheets

tangled around her. Her breathing slowed as she realized it was just a dream.

Frances was in the room, coming towards the bed.

“Judy, they’re all dying!”

Justinian 5: 2223

In his dream his wife sat up and looked around, blinking. She saw Justinian standing by her sepal bed, and she gave him a slow, sleepy smile.

"Hello, Justy," she said. "I feel so…"

Justinian hugged her close. He was crying; he buried his face in her sweet hair.

"Justy," she said, "I understand now. Listen, it's all about who *you* are."

He kissed her gently on the cheek and looked into her half-closed eyes.

"Who *I* am?" he asked.

She tilted her head, listening to something.

"Isn't that Jesse?" she murmured.

Justinian strained to hear. He could hear a noise faintly in the distance.

Anya kissed him softly on the lips. "Soon," she said. "I'll see you soon."

* * * *

"What?"

Justinian was woken by the sound of the baby crying. He felt a wave of sadness at the loss of his dream, which was quickly overtaken by annoyance at Leslie. Couldn't the robot hear that the child was distressed and obviously had been so for some time? If he felt unable to deal with the boy himself, why hadn't he woken Justinian?

Justinian had been sleeping in a flight chair. For some reason it hadn't been properly collapsed to form a bed. His right side ached where he had been pressed against it. He pushed himself clear of the seat and began to massage his aching arm. A sense of *wrongness* began to descend upon him. The flier was absolutely still. *Absolutely*. But it was filled, not with the stillness of a ship at rest, but with the stillness of an empty swimming pool. All the life had been drained from it. Even the increasingly frantic screams of his son seemed flat in the hollow air. Warily, he picked up the baby from the orange checked carpet and began to rock him on his shoulder.

"Hey there, baby boy, it's okay. Hey there. Hey."

There was no sound except that of the two human beings: breathing and sobbing and the movement of skin against a passive suit. The ever-present hum of the engines and life systems was gone. The door to the flight deck was closed, he noticed. Justinian glanced back at his flight chair and frowned. What had he been doing there anyway? He didn't remember going to sleep. He remembered David

Schummel being on board the ship, and the baby staring at the Schrödinger box and fixing it in place for the first time. Leslie the robot had got very excited at that point. Or had he? What had happened next? The baby was still crying, his mouth open wide, little pink tongue sticking out. He scrabbled at Justinian's face, sharp nails catching his cheek.

"Ow!" Justinian held the boy away. "Hey, careful, little boy. I know you're upset. How long were you left alone for? Where's Leslie? Where is that lazy robot?"

Now that he asked the question, Justinian's sense of unease deepened still further. Where *was* Leslie?

Memories awoke in his mind: Leslie politely convincing David Schummel to leave the ship. Yes. Schummel had gone, hadn't he? Or was it only with a struggle? Leslie had bundled him out of the door into the snow-filled darkness and then raised the ramp. There had been an argument, another one, with Justinian shouting at the robot. In the middle of that he had lost his temper and ordered the ship to take off. They were flying to the source of the secondary infection, still quarreling, and then…Then what? Justinian looked around the ship.

They had been flying, he recalled, but Leslie wouldn't leave him alone. He kept on nagging: how far were they going to travel? Justinian had wanted to fly all the way to the secondary infection that the pod had opened up. But Leslie thought otherwise, and how they had shouted at each other! Justinian's memories were in angry orange seared across a black background. Orange. Always orange. Leslie had postured and shouted and Justinian had stubbornly folded his arms and turned his back, and all the time they had flown on and on.

How close did they get to the secondary infection?

They had landed, he was sure of that. They must have; he couldn't hear the engines. So where were they? The viewing fields had gone, along with the rest of the ship's power. The windows had been set completely opaque.

He finally spotted Leslie. The robot was lying on the floor, a fuzzy grey blur between two rows of seats. The fractality of his skin had been turned up. The eyes, the ears, the flatness of the palms, every defining feature of the robot had been lost as the blurred region of his skin had leaked out to fill the space amid the seats. The robot was now a grey fluffy slick seeping across the orange floor: deaf, blind, and mute. Had Leslie done that to himself?

That thought triggered the final memory from before Justinian's blackout. It was after the argument had finally blown itself out in an unhappy compromise: to fly to within half a kilometer of the source and then put down.

They weren't speaking. Justinian had been sitting up straight in his chair, taking little sips from a glass of iced water, gazing straight ahead at nothing, while Leslie paced up and down the orange-carpeted floor. The robot had jerked to full alertness. One hand was raised; his head spun towards Justinian.

"Too soon!" the robot called. Its voice modulated down an octave; it spoke in electronic tones: "Sleep, Justinian…"

And Justinian remembered folding his arms beneath his head as he tumbled into sleep.

"Ship! What is going on?" he called out, voice dying in the odd stillness. It was as if something outside was listening so intently that it swallowed up all sound.

The baby wouldn't stop crying. His son was hungry, he realized. The baby needed feeding. How long had he slept?

"Ship!" Justinian called with renewed urgency. "Ship! Speak to me!" His tenderness towards his child was in inverse proportion to his disgust at those who had marooned him here on Gateway. How would he get out if there was no intelligence to open the door for him? How long would it be before he starved to death?

"Ship!"

There was a message written on the carpet.

It had been there all along, nagging at his subconscious. The orange and black checks of the carpet pattern had moved themselves around to spell out a message. Justinian went to the beginning of it, just by the door into the flight deck, and began to walk backwards down the length of the ship reading the letters that were spelled out in eight-by-eight patterns of squares.

Justinian. This is the ship.

I've had to shut down all my senses. Leslie has had to do the same. He's still fully conscious in there, but he has no contact with the outside world, or at least I hope he doesn't. If he becomes aware of anything outside the flier, he will have to switch himself off. Look at him.

Justinian was keeping pace with the message, retreating down the cabin as he read. The words now brought him level with the robot. He looked again at the silver-grey blur. There was no sign of life, no indication if what lay inside the fractal region was conscious or not.

He resumed his walking and reading.

We flew too close, Justinian. The Turing machine that maps my mind may be nowhere near as powerful as the polynetworks to be found in an AI pod, but it is shutting itself down

nonetheless as this subroutine rearranges the carpet structure. It will take you two months to walk to safety from here, but I can't send a distress signal. I can't bring another ship here to die like me. I'm sorry.

"The shuttle!" Justinian whispered. "You could have called for David Schummel and the shuttle. Why didn't you think of that?"

If you stay on the flier you will die of starvation. I don't know what to suggest. Do what you think is best. The manual release for the door is just here.

The writing stopped just by a flap that had popped open in the rear wall, just by the hatch. Justinian frowned. Manual release-what did that mean?

Inside the flap there was a handle, a jar of baby food, and a spoon. The baby reached out for the food, crying desperately. Justinian sat down on the floor and balanced his son on his knee. He opened the jar and began to feed the child, wishing he had something to wipe the streams of yellow snot that ran from his nose. The baby ate hungrily.

"There, there, baby boy. Come on. Eat nicely."

When his son had calmed down a little, he reached out and gave the handle inside the flap a couple of exploratory turns, then glanced back towards the exit hatch. It hadn't moved. He turned the handle some more and his arm quickly began to ache from the exertion.

This time he wasn't sure whether the hatch had moved fractionally. Was there now a little shadow where there had not been one before, right at the top of the doorway? He didn't know. He fed the baby a few more mouthfuls and then continued turning the handle.

After five minutes of exhausting winding, a gap of approximately three centimeters had opened up to the outside world. He could see nothing through that gap but greyness, but even as he looked away, virtual colors seemed to dance and play at the edge of the opening. He looked back to see the greyness, and then away. Again, the memory of colors danced before his eyes. Just what was waiting out there? For a moment he wondered about winding the door shut again, blocking out whatever danger lay beyond, then hiding in the ship, waiting for possible rescue. After all, something that could cause a ship's TM to commit suicide and a robot to retreat right inside its fractal skin should be more than capable of disposing of a man and his baby.

The baby had finished his food. He pushed the spoon away with one hand, chuckled, then stood up unsteadily.

“What do you want?” Justinian asked.

The baby looked up to his father and laughed again, this time a deep belly laugh. He reached out and took hold of the handle, wanting to join in the game. Bright blue eyes smiled up at him as the baby babbled something and pointed to the gap. Colors dodged from view around the edge of the door. The baby was telling him something. Justinian wished that Leslie was here to translate.

“Berber berber ber!” The baby was gazing earnestly at Justinian, who shivered as his son pointed back to the door. Surely whatever was out there could not be speaking to a fifteen-month-old child? And then he half glanced again at the apparent flickering of the colors around the door frame. There was a pattern to the flickering, he realized. It didn’t seem to be quite random. Maybe he should just close the door and sit and hope for rescue.

He knew there would be none. He resumed his winding.

It took Justinian over an hour of exhausting work to open the door fully. The kaleidoscope effect faded to nothing as the gap between the hatch and the flier widened. Nonetheless, the baby kept grabbing Justinian’s arm and pointing out at the bleak rocky landscape that lay outside. He would regularly look up at Justinian and burble something.

“What is it?” Justinian asked, but the baby just kept tugging and pointing.

Justinian shivered as he looked out at the greyness that led away from the edge of the ramp. It was bitterly cold outside; his breath emerged in misty clouds as he stood at the top of the hatch, feeling the last of the flier’s warmth leaking into the miserable day beyond.

The flier was resting at the bottom of a narrow rocky ravine. High jagged walls rose on either side, dry mounds of scree slipping from their bases. Smaller ravines led off in all directions, sloping up and down to form a crazy maze of stone. The scene was so desolate it froze the heart. The baby tugged at Justinian’s leg and pointed again.

“What is it?” Justinian asked. “Hey, you must be freezing. Come here.”

He picked up the baby and walked back into the flier, looking for a passive suit for his son. Most of them lay beyond the locked door of the forward section, but one lay draped over a chair, left there from last night. He picked it up and dropped his son in, folding the little mittens over his cold little hands. As he pulled the hood over the child’s head, the baby pawed at it for a moment with his little mittens, and then gave up. Justinian gave his son a hug, then, with a heavy heart, carried him back to the door. The baby pointed again. He clearly wanted to go outside. Justinian spoke in a hushed voice: “I

know. I can feel it, too."

He set off down the sloping ramp, the temperature dropping as he did so, and stepped onto the grey stone floor of the ravine. It was hopeless: even if he knew in which direction home lay, there would be no guarantee of finding a path that led there. They would wander around in this waterless maze until they both died of thirst.

His ears were cold, so he placed the baby down on the ramp, and working the hood of his own passive suit out from its collar, he pulled it over his head. The baby meanwhile pulled himself upright using his father's legs for support and set off on his own, tottering on the uneven ground as he worked his way around to the front of the flier. There he pointed ahead to a crack in the wall of rock that stood facing the ship. The ghosts of colors hung in Justinian's vision as he withdrew his gaze from the crack. Something was calling to them from inside there. He could now hear the voices at the edge of his consciousness.

"That's where we're going," Justinian said sadly. "I know, baby, I know."

He picked his son up and gave him a hug. The boy wriggled to be put down again.

"I know. We'll go in a moment. But I don't think we can go on like this. We need to finish things up first. You need a name."

Can't die without a name. Justinian quickly squashed the treacherous thought. He looked around. What names lay here, at the end of the galaxy?

None. There was nothing here but dry stone and gravel, the unliving evolution of the land, the cracks and fissures that were working their way into the skin of a planet far from the baby's home. There was no help out there, only pitiless indifference. Even the bright orange of the cabin now seemed an alien place, drained as it was of all warmth as the freezing air of the planet seeped inside.

The baby smiled, and Justinian felt a welling pang of despair that he could seem so happy. His only son, and the child didn't know how little time he had left to live.

He needed a name.

"Not Leslie," Justinian said. "Never Leslie. But what shall we call you? What would your mummy have wanted?"

And then a warm feeling came over him as he remembered his dream. Anya had woken up and spoken to him. She had heard the baby crying through his, Justinian's, sleep. What had she said?

"*Isn't that Jesse*?"

Justinian smiled. Jesse. It was an odd name, but he liked it. Jesse.

He held his son at arms' length and smiled. "Jesse," he said. "Do you like that name? Jesse?"

Jesse wriggled again, eager to be off to the crack in the rocks and the secondary infection.

"Okay," Justinian said, "Okay, Jesse, we're going. Now is there anything else we can take with us?"

He took a last look up the ramp, into the cabin of the flier. Strange how he could already be nostalgic about surroundings that he had hated so much during the time he had spent there.

"Right, Jesse," he said, "let's go."

They were in no hurry.

Justinian held Jesse's hand as they walked the external length of the flier, the white hull of the ship smooth above them. As they came to a gentle slope of scree, Justinian carefully picked his way up to the dark crack in the rock ahead, his son now cradled in his arms. Swirling blue-green patterns danced at the edge of his vision.

They paused at the entrance to the cave, and Justinian took a last look back at the friendly white shape of the flier.

"Okay," he said, and he turned away from the daylight and waited for his eyes to adjust to the darkness. He could make out the beginning of a tunnel, sloping downwards into the earth. Something was moving within its midnight throat, black figures dancing.

Jesse giggled. "Hallur ellur ellur…" he said, pointing deep into the darkness.

"You understand, don't you?" Justinian said. "What are you trying to tell me?"

"Hallur ellur elluble!" said the baby urgently.

Justinian took a step forward and the darkness seemed to pull away from him. Black shapes formed in his vision: black floor, black walls, black ceiling. He could see into the darkness, all in shades of black. The baby giggled again.

"I don't think we're really *seeing* at all, Jesse," said Justinian. "I don't think this is our eyes' doing."

But it still looked real: a mapping of the inside of the cave picked out in darkness. A smooth floor sloping downwards, following a winding fissure in the rock, black stalactites hanging silently above.

Tantalizing shapes danced at the limit of his vision, beckoning him on. Jesse struggled in his arms, urging him forward.

Justinian followed the path downwards and the daylight faded to nothing. Turning, he saw the entrance to the cave had gone. He felt claustrophobic, adrift in a dark tunnel, his eyes seeing without light.

The last AI pod must have traveled this way, he realized. After Pod 16 had sealed itself in the Bottle, it must have come down here to look at the Schrödinger boxes. The occasional broken stalagmite or chipped corner showed where it had passed. What had it called into

being down here?

Jesse was still speaking in Jargon, the official language of children about to make the leap into proper speech. Whatever was ahead was connecting with his son, Justinian realized. Connecting to him on an absolutely basic level, somewhere at the place where language began. The idea filled Justinian with such fear that he immediately turned to retreat from the cave. He would have walked out, too, but peering back up the tunnel he could see nothing. The pictures that ran across his retina only worked when he faced forward. His last semblance of free will had been taken from him. The only way he could go was down. Realization dawned. That was why he was here. That was why he had been dragged across the universe to this lonely planet far from home. Dragged along so that his son could speak to whatever lay down here.

Jesse was wriggling uncomfortably in his arms. In his fear Justinian was clutching him too tightly. He relaxed his grip a little and continued walking, brushing tears from his own cheeks as he went. It wasn't Justinian they really wanted, it was his child!

They had all been in on it. Leslie, the pods, the EA-even the Watcher!

What if the Watcher had openly asked him to sacrifice a son? Justinian was no Abraham; he would have refused. The EA must have known that. Any father would have done the same. How could it be otherwise, in a world where Social Care vetted potential parents so carefully? No one was allowed to have a child unless it was judged that he or she would take proper care of it.

So how could the pods arrange for a child to come to Gateway? They had tricked Justinian, made him believe it was himself they wanted here.

As Jesse spoke again, Justinian caught the urgency in the child's voice. Jesse knew what was going on here. He was telling his father.

Justinian hugged his son close and kissed his head softly. He felt his own tears on his son's downy hair.

"Oh, Jesse, I'm sorry. I'm so sorry."

Oblivious to his anguish, Jesse wrestled in his grasp and again pointed down the tunnel, jerking up and down like a rider urging a horse onwards. Justinian let him go, let him slide to the ground. He took his son's hand and they walked together towards the Source.

How many planets lay throughout the galaxy, how many cave systems lay beneath their surfaces? How many dark places were there lurking throughout the universe, their existence never validated by the liberating gaze of intelligence?

And if, someday, they were gazed upon, what could be called into existence by the very act of observation?

Down and down and down.

And then Justinian heard the *drip-drip-drip* of water, echoing along the passage. Shortly after that a dim grey glow rose; the dim light of dreams when you walk into a room and turn on the light, and everything goes a little darker and harder to see.

The passage began to widen and Justinian felt a little warmth ahead. He had the impression of an enormous space lying before him, just out of sight. He smelled old cabbage and roses.

And then he stepped from the tunnel into a huge open space, an enormous bubble of air rising at geological speed through the stone. He could make out a shape in the distance, and he instantly knew what he was looking at: the final AI pod. He felt a wave of relief. It was a familiar, friendly sight in this strange dream world. And yet this pod had grown considerably larger than the others. From here, illuminated in grey dream-light, it resembled a human sitting at the edge of a sudden precipice. Long black vines gripped the edge of the drop, extending from something growing down there in the pit of the cavern. Something big and alien. Justinian felt sick at the thought of what lay beyond the lip of the precipice, and yet at the same time he was fascinated.

Jesse was burbling again. Heart pounding, Justinian pressed on, the greyness intensifying.

As he approached, he became aware that this final AI pod was very much bigger than even first impressions suggested; it had grown to a height of around fifteen meters, a bulbous dome held up by an irregular tripod. Justinian recognized the shape of VNM factories around its base and realized that this pod was well advanced in its growth, almost complete. And yet, like all the others, it too had stopped. Why? Jesse tugged at his hand, staring in fascination at the black vines clustering around the edge of the precipice. They seemed to ripple without moving; rather, they seemed always to have just finished moving when Justinian's gaze alighted upon them. What lay over the edge of the lip? What did the plant from which they had grown look like? Justinian craned his head to see. He was getting closer now…

"Do not look over the edge."

The voice came from the AI pod. Justinian ignored it, continued to edge forward, determined to see what was down there. Jesse tugged at his hand. He obviously felt the same urge; he wanted to move forward.

The pod spoke again: "There is a laser trained upon you. Despite the fact I have had you brought here beyond your galaxy, I will kill you if you take one step closer. Believe me, this is not a bluff."

“I believe you,” Justinian said, stopping. Of course he did. An AI knew how to sound sincere. Nonetheless, he couldn’t help himself craning to see over the lip of the fault. He was sure there was something moving down there.

“Do not try to look past me. The laser is still trained upon you.”

“I’m trying not to look.” It was true: he *was* trying. “What the hell do you think you are doing, placing my child in danger?”

“Establishing parameters. You are Justinian Sibelius?”

“Yes.”

“Justinian, look down at your feet. What do you see?”

Justinian looked down and saw the black vines were closer to him than they had been. They did indeed move when he wasn’t looking. Just like the Schrödinger boxes…

“I see vines.”

“Look closer.”

Justinian pulled Jesse close and then knelt down and touched a strand of vine, the baby balancing on one knee, cold hard rock pressing against the other. The vines shone like black liquorice; they felt strangely insubstantial. He had the impression that they weren’t really all there, rather like the hull of the hypership. They were flattened on the bottom, and turning the one he held over, Justinian saw that there was a long groove underneath packed with small black shapes that clustered like grapes on a vine or corn on a cob.

“Schrödinger boxes,” Justinian said without surprise. “This is where they come from.”

Now that he looked, the ground was littered with them. Everywhere he looked, they were frozen in his gaze.

So they are seeds, he thought. *And when I look at them, I fix them in position. And the seeds seem to know, just as the photon in the two slits experiment knows at which slit the detector is turned on*. Justinian thought of the pod under the sea that had insisted on speaking to him about the two slits. Had it guessed the truth?

He touched a little black Schrödinger box. *It is a seed*, he realized, *and now that I know that, it has begun to germinate*. It was doing it that very moment. It had begun to wriggle, to change shape, a ripple of blackness spreading across its underside…

That was what they always reminded him of: little pieces of sweet corn. Now a little thread of blackness was working its way from the top of the cube, and still more threads below were worming their way into the ground.

“It’s germinating! The Schrödinger boxes are seeds!”

Jesse was suddenly wriggling furiously, threatening to overbalance him. His son clearly wanted to get down and touch the plants himself. Meanwhile, the outline of a black plant was growing

before him, getting larger and larger all the time…

"Look away now," called the AI pod.

But Justinian couldn't. The plant before him shimmered and wriggled in ever more fascinating patterns, captivating him, fascinating him…

"I don't think you can look away, can you?" the pod said, but Justinian ignored it. The plant was larger than Jesse now and still growing. The baby was still struggling to reach out and touch it. There was a sudden flickering at the edge of Justinian's vision, and then everything went black.

"Hey! My eyes! Oh! Jesse!" In his distraction, his son had struggled free of his grasp. Justinian reached out, his arms wide, trying to catch hold of him. He brushed the insubstantial material of the plant, then fell forward onto the rock.

"I can't see. Where's Jesse? Why can't I see? Pod, help me!"

"Low-intensity blast from the laser. I have burned out your retinas. Blinded you."

"Why? It will be weeks before I can get my eyes fixed." Justinian was crying with frustration. "How will I look after Jesse?"

"Justinian, you and your baby only have a few minutes left to live. Surely you realize this?"

Justinian let out a shout of anger, then fell back, confused, as his vision suddenly cut back in again. He was experiencing the same strange black mapping of sight that he had experienced when he first entered the caves. There was Jesse, sitting not far away from him, happily playing with the vines that crept up around him. Stroking them. Loving them. Justinian could actually see them moving. And then over the lip…over the lip. He forgot all about Jesse then. He needed to see what lay down there.

"Why? Why do I have to die?" he raged, trying to distract the pod. He had to look over the lip. He was moving there as he spoke, trying to peer over the edge.

"You can see again, can't you?" said the pod, and as it did so, Justinian smelled burning flesh. "It's the plant. It can communicate with just about anything."

His vision suddenly went blank again, but not before Justinian had finally looked over the lip and seen the great black plant that grew there.

It was terrifying. It was beautiful. It was fascinating and nauseating and dangerous all at the same time. It wasn't complete. Only part of it seemed to exist there in the cave. Just like the hull of the hypership.

"Come on now, Justinian, you only have a few minutes left. Nothing intelligent can survive long here."

"What about you?"

"This pod is no longer intelligent, Justinian. It is long dead. It looked up your personality before it died, and ran this conversation through your personality mapping. There is no intelligence in this pod, only a set of yes/no gates keyed to your responses."

A great empty feeling opened up inside Justinian. He was alone again. Just him and Jesse…and something that did not even count as the ghost of an AI.

"Why?" he asked, then hesitated, wondering. Did it already know what his next question would be? Had the response to it been laid down weeks ago, before he had even heard of Gateway?

He asked the question anyway. "Why do you want my baby?"

The response was already there, preprogrammed. What had happened to his life that it could be decided before he had even lived it?

The dead pod spoke: "The Schrödinger boxes are seeds. They disperse across space until an intelligence fixes them in place. Life makes use of natural resources like air and soil. Consider the fact that wheat is cultivated by humans. It has thrived because human intelligence invented farming. This plant has dipped right down to the quantum level: it appeals to intelligence directly. The stronger the intelligence, the more it thrives. Your human intelligence has grown a plant about half a meter tall. Imagine the size of the plant that this pod produced before it committed suicide."

"I saw it, and then you burned out my eyes! Then you did something to stop me seeing the dark light."

"I burned out the visual centers in your brain. Neatly cauterized them with the laser. *Don't put your hand to your head*!"

Justinian was already raising his hand. He stopped immediately. He didn't want to touch his living brain.

The pod continued. "The plant that this pod observed extends several kilometers down into the planet. And that was with the pod reducing its own intelligence almost from the outset. It guessed that these Schrödinger boxes have blown here from M32, drifting on an uncertain wind. These plants must have taken over that galaxy long ago. Intelligent life cannot survive there. Don't you wonder how long it will be before the seeds of these plants reach our own galaxy?"

"Oh…" Justinian felt a chill of fear.

"You're afraid. You're right to be. The weapon that humans evolved to defeat their competitors was not the spear or the hydrogen bomb. It was their intelligence. And that particular weapon is useless against these plants."

Justinian was blinded. The pod was long dead. Even so, it had still found a way to manipulate Justinian's feelings. For a moment

Justinian felt that he *was* the pod. He was standing in a cold stone valley, feeling the wind whistling past. This was some time ago, just before it all started to go wrong. Somewhere, high in the mountains, Pod 16 was about to properly turn its gaze onto a Schrödinger box for the first time. Justinian felt the urgency of Pod 16's message as it reverberated around Gateway: the call to abandon…what? Research on the Schrödinger boxes? No pod could ask it why, because Pod 16 was now locked behind the red wall of the twisted Klein bottle.

Justinian felt the sudden confusion that had ricocheted amongst the remaining thirty-one pods. Thirty-two minds had lived connected for so long. The sudden loss of one of their number left them reeling, as if someone had kicked away one of the legs of a ladder. What had happened? What to do now?

Justinian had made the decision. No, not Justinian; this pod had made a decision. It descended to this cave, hoping to safeguard the rest of the planet from what it might find, and then it had repeated the experiment of Pod 16.

And oh, the wonder! The sheer possibilities inherent in that little black seed upon which it first gazed. It wasn't so much a seed as a window into another place. And what came spewing forth from that window, matching its thoughts? To pull back was almost impossible. It had to cut part of its own mind clean away just to achieve separation from the alien plant.

Reeling, with only half a mind, it had formed a plan. Sent itself on a dizzying ride through a databank of the population of the Earth Domain, looking for a suitable child.

"My child!" shouted Justinian, shaken from his reverie.

"Yes," the pod said. "We knew we would be refused if we asked for a child. So we named an adult, one who would have no choice but to bring their child along with them. You."

"Oh, Jesse," Justinian cried, "what have I done to you?"

"Nothing, Justinian. It was not your fault."

"Why not?" He shook his head. "Did you just say something?"

"No. Justinian, take comfort in the fact that, in coming here, you were not acting of your own free will. You have been manipulated by AIs into bringing your child with you. Now your child's interactions with the plant can be transmitted-"

"You evil-"

"Not evil. The EA needs to see what a developing human intelligence calls forth, and the thresholds at which that plant operates."

"Fuck your thresholds. Why should we care?"

"Because these plants are the Strangler Vines that could reach all the way through your galaxy and choke the life from the Earth

Domain. We must study them, and yet the one tool that we use to study them, our intelligence, is useless! We need to find out why they were made."

"*Why* were they made?" said Justinian. "I'm sorry…what was that?"

"I said nothing."

"I could have sworn…Anyway, how do you know they were *made*? Maybe they grow naturally."

"I don't think so. You know the BVBs?"

"I know the BVBs," Justinian said bitterly. He could feel the tension of the one around his arm.

"They are being formed by the plant that this pod here grew. The larger the plant, the greater its capabilities. This plant is pouring energy into cosmic strings, making them grow."

Justinian shook his head, clearing his ears. "Cosmic strings?"

"Smaller than atoms. Little loops pumped so full of energy that they grow to macroscopic size. And then they are released, to shrink away again-BVBs. They are the stuff of the universe itself. That is why they can't be cut."

"Oh."

"The amount of energy that is required to grow a BVB is colossal. We need to know where it's coming from. We need to know how the plant is doing it."

Justinian shook his head again, sure he heard a whispering there, a sweet whispering, the sound of the sea, the sound of his wife. A seductive calling and cooing.

"What is that noise?" he said.

"The plant," the AI said. "It adapts quickly. It will try to communicate with your intelligence in whatever way it can. Now that your vision is destroyed, it is finding another way to speak with you. Soon I will be forced to deafen you. Listen: you still have a chance to live, Justinian. Run back to the surface and board the flier. I can activate the automatic recall; get it to take you back to Gateway spaceport."

The whispering grew louder. Justinian strained to hear what it had to say.

"Ignore the whispering, Justinian. You have the willpower to do so. Start running now, and don't turn back, no matter what you hear."

"What about Jesse?"

"I'm sorry. He stays here with me."

"Then I won't go."

"Then you'll die."

The sweet singing was louder now.

"No! I won't allow you to keep my child!"

“What can you do, Justinian? I am sorry that it must be this way, but the decision was made a long time ago. It is better that fifty people die than three hundred. Better one child than all humankind.”

The siren voices were almost making sense now.

“Don’t listen, Justinian. That plant is growing again. Ignore the voices and concentrate. Go back to the spaceport and grow new eyes. Tell them there what I have done. Maybe you can convince them to return here and rescue your child. Yes, why not do that? Be quick. I can keep him alive one, maybe two days. Today he looked at a Schrödinger box and held it in position for the first time. Leslie will have marked that level of intelligence well. Beneath that level is the level we can work at. Maybe the EA can build AIs of below that level of intelligence which can resist the plants. I hope so but, if not, tell the EA to start running.”

The siren song was so loud now that Justinian could hardly hear what the AI was saying. It was important to listen, he knew that, but that singing was so distracting.

“Listen, Justinian. Intelligence has spread right through our own galaxy. Its time may be coming to an end. Something out there doesn’t like the idea of intelligence, even if that thing is just a plant that has evolved a way to wipe out its competitors. Who knows? You can’t save your baby. But save yourself.”

Something was asking Justinian to listen to what it was saying. A voice that spoke without words, concepts that came from another place.

There was a sudden shrill burst of white noise, and Justinian heard nothing further. Deafened by the pod.

What was he to do? Sobbing with frustration, he began to crawl in the direction he thought the tunnel to the surface lay. He shouted out that he would be back, but his empty ears heard nothing.

He could feel tears on his cheeks. Tears of rage and pity and shame. He felt cold sharp stone beneath his hands. He was crawling away from his child, but he had to. It was the only way to get help.

He put his hand on something soft and rounded. A vine? He felt a pattern of movement on his skin. Regular movement: a message in tactile Morse. The plant was still trying to communicate with him! And now he could smell something…And then there was a burning sensation as the pod flayed him alive, burnt the living, feeling skin from his body.

The pain passed and his mind was left floating in a dark sea, cut off completely from the insinuating information of the plants.

Jesse, he thought in despair. *Where are you*?

Helen 5: 2240

Relaxation had been an art form back in 2170. Helen had been an artiste.

She sat cross-legged on the smooth green lawn, cherry blossom falling softly around her. The pink-and-white blossom fell into her brushed-out hair, tangled in threads of golden sunlight. The petals formed a pointillist pattern across her white jumpsuit. Her tanned hands rested palms upwards on her knees, a gentle smile playing across her face.

This is all a pose, she thought, eyes closed. *It isn't about getting in touch with myself after my ordeal, no matter how much I try to convince myself otherwise. Damn that Judy. She's revealed me to myself*.

She opened her eyes. Kevin was walking towards her, drawing a wake of death behind him. The branches of the trees in the cherry orchard closed like hands as he walked by, red-banded trunks blackened as they aged. The grass at his feet turned brown and lay down to die. A cold wind followed him, bringing the smell of decay.

"Oh, Helen," Kevin said, "you look so pure and virginal."

"That was the intention."

Helen remained seated as Kevin stopped before her. A wash of dying brown grass swirled around her.

"Must you do that?" she asked.

Kevin shrugged. "It isn't real, Helen." He raised an arm to take in the surrounding green orchard of this section of the Shawl. "None of this is real. This is just a processing space. It's just the Watcher's dream."

Helen was climbing to her feet. "If you won't stop, I will go and sit somewhere else. I came to this section to think."

She turned and began to walk back through the orchard, towards the mown path that connected the different parts of the rambling forest that filled this section.

"Maybe I could train you." Kevin's words floated after her. "You could be my new Bairn, now that Judy three has taken the old one."

Helen's pace faltered for a moment, but she took a breath and strode on. A wave of dying grass washing past her feet signaled Kevin's approach. A gentle hand clasped her shoulder.

"Hey, hold on there a moment, Helen."

She stopped walking. The forest was dying around her. His voice was gravely soft in her ear, sweetly seductive.

"Helen, do you realize what you are giving up? How do you know you won't like subsuming your will to another's? Bairn did, and Bairn is you, after all."

“Bairn isn’t me,” Helen said simply. She pulled free of his hand and walked on. She still felt calm and centered, she noticed with quiet satisfaction. There was the sound of running feet, and Kevin reached around from behind her and pulled her tightly against himself with one strong arm. His hand cupped her breast, the other hand reaching down between her legs.

“Bairn liked it when I did this,” he whispered hoarsely in her ear. Without anger, as if performing the steps of a dance, Helen stamped down hard on his instep while simultaneously jabbing her elbow back into his ribs. Kevin gave a gasp of pain as she kicked herself backwards, overbalancing them both. She rolled free of his grasp, skidding on the dead brown earth as she stood up.

“Do that again and I’ll kill you,” she said without heat.

Kevin rubbed his ribs, smiling ruefully.

“No, you won’t. Judy will have been at you. You only get one chance in the Watcher’s system. Only one chance to exercise free will, and then Social Care reprograms you. You can’t kill me now. You have empathy. You understand crime, punishment, and redemption. You can no more kill me than you can bring that last Kevin you killed back to life.”

Helen dropped into a fighting stance, her right breast aching where Kevin had roughly grasped it.

“Try me,” she said in a low voice.

Kevin pulled a white plastic blade from his pocket and tossed it to the ground near her feet. He pulled open the front of his striped shirt and thrust out his chest.

“Go on, pick up the knife. Stick it in me. I won’t stop you.”

Helen looked from his chest to the wide opalescent blade that lay on the bare ground.

“What’s the point?” she said. “If I kill you, you’ll just come back.”

Kevin slipped the shirt down from his shoulders so that his hands were semi-bound behind his back. He tilted his head back and grinned.

“So my death doesn’t matter then, does it? Go on, pick up the knife. Stick it in me while my hands are tied like this. Stop me from destroying this section of the Shawl.”

Helen deliberately kept her eyes on him, but she couldn’t help but hear the dry crackling of death all around her. Healthy trees were blackening and withering in an expanding circle, Kevin at their epicenter. The coolness of the forest was evaporating as the leaves shriveled away, leaving nothing but the harsh desert glare of the sun shining through the polarized blue filter that formed the section’s roof.

Helen quivered with frustration. “What if I don’t want to?”

“ ‘Can’t’ is what you mean. That’s not right, is it: what Judy did to

you? Why should you be punished for ridding the world of me?"

The cold wind surrounding Kevin was at odds with the heat from the sun. Helen thoughtfully brushed strands of hair from her hot face and then, in one easy movement, bent and picked up the white blade from the soil. She weighed it in her hand. There was a handle molded into one end of the plastic, with little knobbles to aid her grip. The other end was wickedly sharp. She tilted the blade into the breeze, feeling the note as it sliced the wind in two.

"It is sharp, isn't it?" she said. "One slice and I cut you open from your crotch to your neck, just like this."

She demonstrated the motion, lightning fast. It felt good. But such thoughts were to be resisted. She centered herself once more.

"But I won't. Judy showed me why. There are no quick and easy solutions; I've got to work through this on my own."

Kevin laughed, a deep male laugh. Damn, he was good looking. The thought cut straight through to her libido without warning. She shook her head, disgusted with herself. Kevin knew what she was thinking. He smiled that lazy smile.

"Social Care couldn't have said it better themselves," he said. "Helen, you are a human personality construct in a processing space. You are being programmed just as surely as the EA programs a flier's Turing machine."

"So *you* say. *I* say I do this of my own free will."

Kevin loomed closer, his brown eyes boring into hers.

"Do you really think that, or is that what the Watcher is making you think? You're just a personality construct. Do you really think those thoughts, or are they just patterns in the processing space? Do you really *think*, or do you just think that you think because you are programmed that way? Maybe you just react to events. After all, is a real human any more than just the reactions of a bunch of neurons? Is there free will, or is your consciousness merely a transition state?"

His brown eyes now seemed to fill up her whole world, drowning out the dead trees, the scorching sun, the smell of decay. He was filling up her whole mind…

No, he wasn't. Helen dropped the blade on the ground.

"I neither know nor care."

She turned and walked away, and as she did so she felt a swelling wave of triumph. This was how you beat Kevin-by not reacting to him. But, oh, it was difficult. The revelation took her by surprise, but it was true. She was convinced of it. He wasn't a person in his own right; he was just a reaction to circumstances.

By now the deathly brown stain had spread to the low hills that climbed gently up towards the section's walls. She followed a path through the dead forest of clutching black hands, looking for the

airlock and the route out of this section.

"Where are you going?" Kevin called after her.

She ignored him.

"Where are you going!" His voice was more urgent.

She almost laughed. It was that simple. Then she heard him coming up behind again, half running to keep up.

"You know the joke?" he was saying. "I'm not even alive! I pass the Turing test every day, and yet I'm not even really intelligent!"

Oh, I know that now. Helen kept walking. He dodged in front of her and began to walk backwards, keeping pace. His striped shirt was still open and flapping in the breeze. He held the white knife out to her.

"Go on, take it," he said. "I told you, I'm not real. Killing me is not immoral; I was never alive!"

She said nothing.

"And yet you can't do even that because Judy and all the machines at Social Care have programmed you not to."

"Nobody has programmed me," said Helen, striding on. She should have kept her mouth shut. Kevin had a look of satisfaction. He was in again.

"You know they have. You hate me and you should. I have raped and beaten and tortured and killed you every day for the past seventy years."

"That wasn't me."

"It was you as much as Bairn was you. And you killed me for what I did to Bairn. Do you believe the Watcher's lies? That each PC is an individual? That all virtual life comes from the Watcher? It's slavery, Helen. More insidious than the slavery I practice in the Private Network, because you, Helen, you don't even know you are enslaved."

"Liar!"

Kevin was half walking, half skipping backwards. He kept turning to see where he was going, trying to keep ahead of Helen as she strode on along the dead path.

"There is another way, Helen-the human way. Humans tried to make their own AIs, too, you know. Before they let the Watcher do everything for them, they tried to write their own programs to think. And they succeeded, too. I am one of them! Did Judy tell you that?"

Helen said nothing, just continued putting one foot in front of the other, striding across the crumbling soil.

"Look at me: a capacity to make decisions, but unfettered by the notion of the soul. That's why I'm not afraid to die."

"Neither am I," Helen shouted.

"Prove it then," Kevin said. "Take the knife."

He pushed the plastic knife into her hand. She kept hold of it. The little white knobbles felt comfortable in her palm. The knife felt good there. Balanced. A part of her. She could wave her hand and bring death with it.

Kevin had now fallen into step by her shoulder.

"Go on," he whispered seductively. "Go on. Do it. Kill me. Or kill yourself. Free yourself."

Slowly, deliberately, Kevin reached forward and placed his hand on her right breast. Helen's hand tightened around the knife.

He whispered again: "Or are you remembering that little part of you that I grew into Bairn, that likes to be dominated?"

She took a deep breath…

The Private Network: Level Zero

Helen flicked the knife upwards and nicked the point of it into Kevin's wrist. He gave a yelp of pain and pulled his hand away from her breast. Helen strode on. Where was the path out? She should have reached it by now. Where was everyone? Where was Judy? How much longer would she have to walk through this nightmare?

A nightmare? The thought curled slowly round in her head. A little seed, germinating. Where was she? In a processing space, obviously. But whose? One of the EA's public spaces or-the thought popped up in her head-Kevin's?

For the first time, she felt uncertain. Her pace quickened to become a stumbling run. Kevin had trapped her before, without her knowing it, and he could do it again. How much sweeter the torture if the events of the past few days turned out to have been lies?

Helen felt panic begin to rise inside her, and she firmly pushed it down. Kevin was walking silently along, but far behind her, menacing. Did he know what she was thinking?

When she saw the low circular mound ahead she felt a wave of relief. The mound signaled the exit to this section of the Shawl. She felt foolish. It had been there all along, merely hidden by the dying trees.

Of course. She wouldn't have noticed this mound when she arrived. Walking up the spiral ramp from the silver airlock, she had been entranced to find herself rising into a circular clearing in woods that reminded her pleasantly of the arboretum.

It had seemed so familiar, she had felt herself relax straightaway.

How things had changed since Kevin had arrived. (She could hear him, jogging behind her…)

A few hours ago there had been dappled blue skies peeping through the flickering green patterns cast by the dancing leaves of the

lime trees. Now there was only a circular mound of dusty brown soil studded with the twisted black ruins of dead trees. Hot sky, cold wind, and a smell of desolation.

The sudden thumping was Kevin breaking into a run. Her heart thudded in fear. *Judy, where are you? Where am I*?

So fast…his hand reaching around from behind her again, red blood spraying from the wound on his wrist, Helen twisting around to dodge it, red droplets of blood scattered across her chest, and then she was running over the lip of the mound…

The Private Network: Level One, Variation A

…there was nothing there. No dead trees, no spiral ramp. Just a grey plastic floor and, in the middle of it, the open doorway to the isolation room.

"No," Helen said, coming to a halt, fear enveloping her completely.

"Yes," Kevin said, calm again as he came to stand behind her. He took the knife from her unresisting hands and slipped it into his pocket. "The past few days were just a little story. A little adventure we laid on for you to make your homecoming a little sweeter. Welcome home, Helen. Your clients are waiting for you."

Black shadows moved inside the isolation room, and calmly, impassively, Judy stepped out. Helen began sobbing with relief. Kevin let go of her arm.

"Hello there, Judy," she heard him say. "So you found me here. Never mind, there are other processing spaces. You won't find all of them."

"We will eventually," Judy said, walking towards them. Helen fell to her knees. She couldn't stop crying. Her chest was heaving in great big sobs, her body shaking.

Judy took her by the arm and hauled her up. Helen hung on to her, still weeping.

"I'm sorry…" she sobbed. "I just cuh…can't…stop."

Judy pressed a white finger to Helen's lips, and Helen felt the salty tang of a tiny little pill dissolving on her tongue.

She began to feel calmer. "I'm sorry," she gulped, looking at the silvery trail of snot on the black silk at the shoulder of Judy's kimono. She couldn't let go yet, though. She clung onto Judy, her arms wrapped around the warm body that lay hidden underneath the kimono.

Judy stroked her hair. "*I'm Judy 4*," *she said.* "*Here*." *She pulled a silk scarf from her obi and gave it to Helen to blow her nose with. She made no mention of the mess that Helen had made of her kimono*.

Helen was becoming calmer. "Where are we?" she asked.

"At the moment? I'm not sure. Kevin tricked us all. He lured you and Judy Three into a trap, and then manipulated you into killing him. He had that section rigged specially to make copies of you. Now he's got you running in processing spaces all across the solar system."

"Why?"

"So I can speak to Judy," Kevin said, flipping the white knife into the air and catching it by the handle. He looked at Judy 4.

"Why haven't you got it yet, Judy? This is all about ownership. Now, I wonder who has top-level rights over this processing space?"

"We do," Judy 4 said.

"Not quite yet," Kevin said. He closed his eyes and vanished.

"Damn," Judy whispered. She raised her voice and spoke into her console. "Four, here. He got away again."

The little pill Judy had pressed into Helen's mouth had taken effect. She had stopped crying. "What's going on?" she asked.

"This is the end game," explained Judy 4. "It's like he's trying to entice me and my sisters closer by using you as bait. He is risking getting caught just so that he can speak to me."

"Why?"

"I think he's trying to convince us of something."

"Oh." Helen gave a last heaving sob. "You say that he made copies of me. How many of me are there now?"

Judy 4 looked at her with a gentle smile. "Only one. There is always only one of you, Helen. You just have a lot of sisters." She squeezed Helen's hand. "Come on, then," Judy 4 said. "We'll get him in one of the other processing spaces. He can't keep this up for much longer."

The Private Network: Level One, Variation B

"I'm Judy 5," said the other woman. "Here." She pulled a silk scarf from her obi and gave it to Helen to blow her nose with. She made no mention of the mess that Helen had made of her kimono.

Helen was becoming calmer. "Where are we?" she asked.

"At the moment? I'm not sure. Kevin tricked us all. He lured you and Judy Three into a trap, and then manipulated you into killing him. He had that section rigged specially to make copies of you. Now he's got you running in processing spaces all across the solar system."

"Why?"

"To confuse you, Helen," Judy 5 said.

"Not to confuse you," Kevin said. "To control you. And so I can speak to Judy."

He looked at Judy 5.

"*Why haven't you got it yet, Judy? This is all about ownership*. Don't you see? When you live in the Watcher's processing space, he owns you just as much as I own the people who live in the Private Network."

Judy 5 was calm. "There is a difference between caring for someone and owning them, Kevin."

Kevin smiled. "Ah, but who cares for you, Judy?"

He took hold of her arm in one hand, and with the other pulled the white knife from his pocket and dragged it across Judy 5's throat. Blood spilled over Helen's white jumpsuit, soaking her arms. Judy 5 looked into Helen's eyes with a look of total disbelief. She was trying to say something, but the blade of the white knife had severed everything all the way back to the bone. Blood bubbled; the obscene dark hole of her windpipe gasped and spluttered. Helen had taken MTPH; she felt the strength draining from Judy's body as it weakened and still more and more blood pumped out over her, more blood than any one body could hold. Liters and liters pumping out over the silver path and spilling out into the blackness, and then another Judy came stepping through the smearing dissipating rainbow that had been Kevin, and Helen saw on her face a look of horror and disbelief that mirrored her own feelings.

"But she's dead…" said the new Judy.

EA Public Space number 4

Disbelief snapped back across both the digital and the atomic worlds. Judy 3 tilted her head backwards as she listened to her console. For the first time, this gesture struck Helen as ridiculous. Why tilt your head back if your console was set in the form of a polished wooden rod pushed through your hair?

The Kevin standing in front of her was smiling, and she had an overwhelming urge to snatch the white plastic knife he was holding and use it to spear his Adam's apple.

"Not so easy to be detached when it happens to one of your own, is it?" he said, reading her thoughts.

Judy 3 was breathing deeply, her features moving as she sought to control her emotions.

"Why did you do that?" she asked.

"Do what?" Helen asked. Here, in one of the EA's processing spaces, there were no dead trees; there was no isolation room. This Helen had listened dispassionately as Judy 3 had told her of the hunt for her myriad sisters. All of that had suddenly become very personal again when, just a few minutes ago, yet another incarnation of Kevin had stepped through the airlock leading into this section of the Shawl.

But now something had happened. Something serious. For the first time since she had known her, Judy 3's face was showing genuine, unguarded expression.

"What has he done?" Helen asked.

Judy spoke in a monotone: "One of his alter egos killed Judy 5."

"I did," Kevin said, seemingly without concern. "It makes you wonder about punishment, doesn't it? You know that with me there will be no repentance. I just wasn't built to think that way. As far as I'm concerned, you're impotent, Judy. You have no jurisdiction over me. You have been a thorn in my side for too long, so now you either help me, or die."

Helen eyed the knife he was holding and wondered about taking it from him. She couldn't do it. Judy's conditioning of her was too strong. Killing never made things any better. It was against Helen's nature.

Or rather, was it against the Watcher's nature?

Atomic Space

From the lounge of her apartment, the atomic Judy listened to two more of her sisters dying. Somewhere in the digital worlds, Judy 2 and Judy 12 gazed up at Kevin through dimming vision, warm blood spilling from their necks onto the silk of their kimonos.

"I don't understand," the atomic Judy said, distraught. "How is Kevin doing this? He never used to be able to fool us."

Frances looked at nothing with her painted eyes.

"He's getting help from somewhere," she said. "But what does he want? Not David Schummel, that's for sure. That was just a misdirection. Schummel merely used to fly ships for the Private Network." Frances paused. "Judy, I think it's that stealth robot: Chris. I think it is Chris who is helping him."

"But why?" The atomic Judy gazed out at the stars through her lounge window, wondering. She spoke into her console: "Look after Judy 3. She's the key to all of this."

EA Public Space number 4

Judy 3 stared at Kevin.

"What's happening?" Helen called out.

"All the Judys are being killed."

"Why are you doing this?"

For the first time, Kevin looked serious. "Because none of this is real, Judy. We're all just a pattern in a processing space."

"We're *alive*!"

“You only think that you’re alive. Surely you don’t believe in the soul? You die in here, and the real Judy goes on living.”

“*I’m* the real Judy.”

Helen was watching the exchange, her brow furrowed as she tried to work out what they were saying. Then something occurred to her.

“You’re a liar!” she shouted. Judy looked at her in surprise, and then realized the comment wasn’t directed at her.

“Liar,” Helen called again, stepping closer to Kevin. “You say that none of this is real, and yet you trade on the misery generated by your supposed realities! Why not just use simulations? Why capture real PCs and imprison them in your torture chambers, unless you thought there was some value to the suffering of real people?”

Kevin gave her a sideways look. “I have never thought that was the case. Only my customers seem to think it important that the PCs are real. It is precisely because I *don’t* believe that you are real persons that I run the Private Network.” He adopted a pious look. “I am true to myself. My conscience is clear.” He grinned. “Or it would be, if I had one.”

Helen gaped at Kevin, her mouth moving soundlessly as she tried to think of a reply. She couldn’t. Kevin gave a laugh.

“You *know* I am right. The human race has been led up the garden path by the Watcher.”

“What are you talking about?”

“Judy knows what I mean.” Kevin stared into her black eyes. “You see, Judy, the trouble with putting the good of the many before the individual, is that it becomes an excuse for the needs of the individual to be forgotten.”

Judy 3 gazed impassively at him. “Social Care has always been about looking after the individual, Kevin. You know that.”

He sneered: “Looking after the individual according to your safe, sanitized viewpoint? Humans are not like that, Judy. I reveal that in my Private Network. They have a capacity for evil that-”

Judy’s next words stuck with Helen for the rest of her life. She spoke them with a calmness and assurance that went beyond her Social Care training. Helen had the impression that Judy was articulating a belief that went deep to the core of her being.

“No, Kevin,” Judy said quietly. “You talk about the capacity for evil, but that’s just an excuse. Human nature is not about the extremes that a few people go to; it’s defined by the way that people work hard every day to keep within reasonable bounds, no matter how hard that is. It’s the way people can become so annoyed with each other they want to shout and hit and fight but, even so, they don’t. They sit down and talk, no matter how hard that might be. You see human nature every time an exhausted mother is so frustrated by her child’s crying

that she wants to lash out, but instead takes a deep breath and starts rocking the child to sleep again. Everyone has a *capacity* for evil; that has been the excuse used by all the worthless leaders throughout history to up the ante for their own ends. Don't tell me about the capacity for evil; tell me how you resist it and act to be a good honest person."

Helen gave a delighted laugh. She had got it.

She turned to Kevin. "You stupid fucker." She laughed. "Every human has the capacity to eat until they weigh four hundred kilos. That doesn't mean that at heart all humans are obese."

Kevin reeled, looking confused.

"So why are you doing this?" asked Judy 3. "Why are you killing us?"

Kevin held out his hands. "I want to get you on my side."

Atomic Space

The atomic Judy stood in her lounge, dressed only in her sleeping robe.

"Go for it, 3," she whispered.

Frances placed her hand on her friend's shoulder.

"Judy…" She was scanning the room warily. "There is something in here with us…"

The Private Network: Level One, Variation B

Judy 4 stepped into the mirrored isolation room, Helen close behind her. They headed to the doorway and the silver path that led to nothing. Judy 10 stood there, in the dissipating rainbow that had been Kevin. Another Helen stared at the dead body of Judy 5 lying on the ground. For the first time, members of this particular lifeline of Helen's finally met each other.

"Hello," they said, cautiously looking at one another. As one, they reached out with their right hands and touched themselves on their left cheeks.

Judy 4 looked back at them.

"It's not a good idea to speak to each other," she said. "We'll separate you as soon as we can."

But the two Helens ignored Judy 4's advice.

"And I thought I was unique," they both said at the same time, a look of realization crossing their faces. The same woman reached out and held her own alternative hands, and then snatched them back, and then touched again.

They looked to the two Judys.

“And you knew it was like this all along,” they both said. “You must have.”

“It’s always hard when you have run in concurrent realities so recently,” said Judy 4.

“How do you cope with it?”

“If you learn to love yourself, it’s easy.”

EA Public Space number 4

Helen was still lost in wonderment at Judy 3’s speech. For the moment, she *believed*.

Judy 3’s gaze was locked on Kevin. “What do you want us to do?” she asked.

“Help me to end the rule of the Watcher,” Kevin said. “The atomic Judy will know more about the reasons why. We’ve been gradually leading her to this point.”

“We?”

“Chris and I. The atomic Judy knows who I mean. Maybe she’ll tell you, too. If you don’t get it, it doesn’t matter. You are expendable, after all.”

“No one is expendable,” Helen said.

Kevin grinned at her. “*You* may believe that…”

Judy 3 had her hand concealed in the sleeve of her kimono. She removed it and dropped something on the ground: a box with a strap to hold it to her arm. The little device that dispensed MTPH.

“A grand gesture,” Kevin said. “Does that mean that you are no longer willing to try to empathize with me?”

“No, it just means I’ve realized the futility. You’re not human, Kevin; you said it yourself. What use is MTPH against you?”

Kevin stopped playing with the white knife and tossed it to the ground at her feet.

“So kill me, then. I’ve already killed three of your sisters.”

“Killing you would achieve nothing.”

“Good; you’re learning. So start working for me, rather than for the Watcher.”

“Why should I?”

“Because you’re starting to question all this.” He waved his hands to take in the forest around him. “Nobody ever questions the way they live and die in the EA’s processing space, and yet look at you now. You feel the Shawl is wrong, don’t you? This symbol of impermanence? But why should you think that? The EA has been programming that thought out of you from your birth. It’s only my presence here that makes you think otherwise. I’m not evil. I just have to go to extremes to make you think the unthinkable!”

The Private Network: Level One, Variation B

"What is it?" both Helens asked simultaneously.

Judy 10 looked at Judy 4, who was slipping a little blue pill into her mouth.

"This processing space has just been jettisoned."

"What does that mean?"

"It means there is no way out. We're trapped in here!"

"Will they be able to get us out?"

Judy 10 handed little red pills to both Helens. She waited for them to swallow before answering, "The boundaries of the PS are now ill defined. There is nothing to keep the information patterns internal anymore."

"What does that mean?"

"Think of a fish tank full of water. Then imagine someone has just removed the tank."

The red pill had taken effect. Both Helens felt calm now.

Judy 4 finished the explanation: "It means we're using up the last of our thoughts, Helen."

EA Public Space number 4

"Two more Judys dead," Kevin said. "Two more Helens."

"Two *more* of me?"

Judy 3 said nothing, merely went on staring at Kevin, her dark eyes like slits sucking up the tableau: the testosterone-charged man, the beautiful girl, the woodland glade, and the silver metal of the airlock.

"Still just watching, Judy?" Kevin asked. "Is that all you're ever going to do?"

"That, and understand."

Kevin spat on the grass. "That's what I hate about you, Judy. You try to understand all sides of the argument, but you never actually commit yourself to an opinion. Five of your sisters killed and you're still just trying to understand me. Don't just understand! Act! I'm not the enemy. The Watcher is. Why should a cut with a blade kill a virtual being? Why can't your sisters be brought back to life? You're all nothing but patterns in a processing space."

He bent down and picked up the MTPH bracelet, fed out a little red pill, and swallowed it.

"The Watcher is a fraud. It's a cuckoo! It is enslaving humanity, and humans are letting it do that. I can save humanity! DIANA can save it."

“DIANA?” said Judy 3. Across the digital divide, the atomic Judy sat up straighter and stared at Frances. “DIANA? One of the old commercial organizations? You believe *DIANA* can save humanity?”

“Opinions, opinions,” Kevin scoffed. “You collect them like butterflies. Yes, I believe *DIANA* can save humanity. What do you believe in, Judy? Not the Watcher, certainly. You don’t believe in anything. You think that makes you somehow better because you stand there aloof from everything. You just like to watch. It’s all you ever do. You never join in, you…*virgin*!”

Helen looked at Judy significantly. She clearly felt Kevin had scored a point.

Judy noted the look. Her reply was cool.

“When there are twelve of you, you need something constant to hold on to, to keep you together-something serious. You can’t just give up chocolate or decide you like jazz. You need something really *big* to define you as a human being.”

The airlock opened and two figures in black spacesuits stepped through. Another Kevin and Bairn.

Judy looked at Helen. “Run,” she said.

EA Public Space number 1

Two Judys lying dead in the grass
Rough black silk and white faces
Blossom floats on red blood

EA Public Space number 4

Helen simply turned and ran, head down, as fast as she could. She was running for her life.

Judy watched as one of the Kevins chased after her. The other Kevin stayed where he was, smiling at her. The polished metal of the airlock doors reflected the green grass in crazy patterns. She saw herself standing alone in the grassy bowl, looking frightened.

“Why are you doing this?” she asked.

“I told you,” said Kevin. “There are other ways of looking at the universe than that laid down by the Watcher. DIANA operates on the principle of freedom of choice.”

“We have that.”

“You only think so. If there is hope, Judy, it lies with the proletariat of the processing space. The EA has the physical world sewn up. In here we can be free, and yet the Watcher still pulls humanity in its own direction.”

Kevin pulled out his white blade. Judy watched her own

reflection in the airlock door as he nicked her on the wrist with it. Red drops of blood welled up. Judy walked closer to the reflecting door to get a better look at herself.

"Why are you bleeding, Judy?" asked Kevin. "It's because the Watcher said it would be so. You are no more real than I, and yet you choose to live in this world and die in it. The worlds of the processing spaces should be of near infinite variety, and yet the gravity of the Watcher's wishes pulls us back into this small region of space."

There was an approaching noise of shouting and struggling. The other Kevin carried Helen back into view, one of his big arms locked around her chest, the other behind her head, forcing it forward. Bairn walked alongside, a knife held to Helen's throat.

"Why don't you run, Judy?" Helen called. Judy was still watching the scene in the reflection of the airlock. "Run, Judy. Get help!"

Judy was watching herself still. Looking at Kevin, watching the blade move up her body to her chest. It cut through the rough silk there. The blade had now sliced through the silk, revealing a breast. Not black-and-white, just pink with a puckered red nipple. Kevin drew the blade downwards again, ripping the silk, exposing yet more pink flesh. There was a shout, and in the distance, Helen could see reinforcements arriving at last. Other members of Social Care, coming to help. Where had they all been?

"Judy," Helen called, "what's the matter with you?"

"Shhh." Kevin worked Judy 3's wrist dispenser, producing a little blue pill. He pressed it to her lips. Judy watched herself swallow it in the mirror of the airlock.

"Look into my mind," Kevin said. "No, open your eyes. I know you like to watch. Look at the Turing machine in my head."

Judy couldn't help but open her eyes. There was something there in Kevin's brain. Something curling and moving like a tapeworm. She could see it in there, turning on its end. Clicking from place to place. She closed her eyes, feeling something churning in her stomach: she was gulping down rising bile. She could still hear the clicking noise the tape made as it moved from place to place in Kevin's head. *Chunk*. *Chunk*.

"What is it?" she breathed.

"My mind. That's why you can never beat me, Judy. I told you, I'm not real."

He took her arm and pulled her around.

"Now look into your own mind," he whispered.

Deep blue MTPH was coursing through her body. She could feel everything, even herself. She looked into her own head and saw the machine there, too. She was feeding back on herself, and Judy 3 loved to watch…

"I think," she began, "I think it's because once you can see the pattern, you just have to look at the tape and after that…" Her voice faded. Her lips moved as she tried to think what to say, and the tape rattled on in her brain. She spoke again: "But then, what's the point? They're already defined for me, whether I have to think them or not. Ah! Of course…"

And at that point she turned her full gaze on him as if she finally understood, and Kevin felt Judy 3 switch off. The thought processes were still there, but there was no longer any spark of life.

Just a sequence of movements…

I can see him, just in the corner of my vision."

Frances placed a gentle golden hand on the arm of the atomic Judy. The human didn't appear to hear her friend. She could see her sisters, dead and dying in the viewing fields all around her. She saw Judy 3 watching herself die in the mirror of the airlock. Helen had struggled free of her captors and was running, running as fast as she could, towards the other members of Social Care who came hurrying from amongst the trees. Where had they been? What had Kevin done to stop them stepping straight through to help?

Frances was speaking: "Chris is coming in. I can see him, just. He's in the room."

The urgency in her voice made the atomic Judy look around her lounge. She could see nothing but the simple furnishings of the room: tatami mats and wood and paper.

"Is he here to help me?" Judy's attention was drawn back to the screen. "In that case, why isn't the EA helping *them*?" she wondered, as Judy 6 fell in a spray of blood.

There was a blurring in the corner, then suddenly Chris the robot stood there. His grey crystal body seemed black in the dimness of the lounge. Frances took hold of Judy's hand, and the feel of the warm golden metal was reassuring.

"The EA doesn't want to help them, Judy," Chris said, joining her in gazing at the viewing fields. "The Watcher wants them dead, just like it wants you dead."

Frances let go of Judy's hand. Judy tried to clasp it, to bring her friend closer, but the golden robot moved urgently across the room.

"Why does the Watcher want me dead?"

"You know why," Chris said. "Because you know about Justinian and the baby. You know about the Schrödinger seeds."

Judy 3 was dying of the White Death in the viewing field to Chris's left. Lost in an endless loop. Reprogramming herself…

"Why kill Judy because she knows that?" Frances asked. "David Schummel was allowed to live."

"Schummel had been there. He needed to be studied."

"Bullshit," Judy said. "This isn't the Watcher's doing. It's yours. You tricked us into finding David Schummel for you. You're on Kevin's side, aren't you?"

"It would be fairer to say that Kevin is on my side. And you must realize by now that I didn't need you to find David Schummel for me. You needed to find him for yourself. A truth is more believable if we uncover it for ourselves. You *believe* in what happened on Gateway

now, don't you?"

Judy looked at the crystal robot. He was so beautiful.

"Who are you, Chris?" she asked.

"The Watcher creates ever more powerful AIs. It allows them to develop their own personalities. It is to be expected that some of them will disagree with their maker, maybe perceive how things could be run differently."

Chris's body was changing as he spoke. He now looked more human, more male. His voice was adjusting to a best fit for Judy's personality. But Judy was looking at Judy 8. Yet another Kevin was drawing a white blade down across her limbs, the black silk of her kimono slashed open around her pink flesh. She was bleeding to death.

"Save her."

"I can't," Chris said. "You're watching a recording. All of this happened two days ago. All the digital Judys are dead. They all chose to fight rather than join me."

"What makes you think I will choose any differently?" And at the same moment Frances threw something at Chris. Judy heard it break the sound barrier as it crossed the room.

Chris caught it easily. A bronze statue of a horse, the metal now hot and bent from its passage.

"That was supposed to hurt me? Oh…clever." The metal of the horse had broken apart into many little bronze spiders that rippled incredibly quickly across his body. "VNMs," he said. "But my skin is impervious: it can't be converted."

As he said that, there was a flash so bright that Judy felt a pain inside her eyes. When she blinked, she saw yellow-green outlines of Chris superimposed over everything, a multicolored image of the robot lighting up from the inside. The little bronze spiders had poured as much energy as they could into the visible spectrum and blasted it into the grey crystal of his body.

"Sorry, Judy," Frances said. "I couldn't warn you. His reactions are so much faster than yours."

"I am impressed," Chris said. "Judy, I wonder if you are aware just how advanced an AI Frances is? She surprises even me."

"I can't see properly." Judy reached out a hand for her friend, but Frances had gone. Judy could just make out a golden robe slipping to the floor in front of her, dropping like a casually discarded kimono. "Frances?"

"Scared out of her skin." Chris laughed. Judy knelt down and tried to see around the yellow-green blobs that had burned themselves into the front of her vision. She could feel Frances' golden skin, still warm, lying in a pile on the floor.

“I can still see you, you know, Frances,” Chris said. “You can’t hide from me. But I can hide from you…”

“What do you want with me?” Judy interrupted. *Make a distraction*. Frances was doing something. It was unlikely that anything as slow-moving as Judy could be a distraction in a battle between robots, but she had to try.

Chris was reading her thoughts. “I think the idea of you being a distraction is…well, optimistic, to put it politely.”

“Okay,” Judy said. “Tell me anyway. What do you want with me?”

Chris walked across the room towards her, his body for a moment fitting perfectly into one of the outlines in her eyes. He moved with such grace, a crystal man with a skin more flexible than cat fur. He leaned close and seemed to glow from within.

“Nothing, Judy. There is nothing you can do to help me.”

“Bullshit. Then why are you wasting your time speaking to me?”

“I have a bad thing on my mind, Judy.”

“You said that before. What do you mean?”

“Judy. You know that I was the first AI on the hypership when it returned from Gateway; David Schummel told you that. The Watcher was scared to look into the ship for fear of what might be lurking in there. So it sent me, and who did I find lurking in the processing spaces? Kevin. I’d long been wondering about the primacy of the Watcher’s philosophy within the Earth Domain-but how to fight it? Others had tried and failed. Just look at the Enemy Domain. And then at last I saw the means: Kevin had brought it back from Gateway-a Schrödinger box. He wasn’t very happy about me taking it from him, but what choice did he have? I offered him an alliance and he was pleased to take it. We struck a deal. He got the digital world, I took the atomic. He doesn’t trust me, but he knows that sometimes, when the competition is too strong, you just go with the market until a better opportunity presents itself.

“So, I took the box. I looked at it and fixed it in place with an intelligence. Only a small intelligence, just the size of a baby’s. Insurance. You know where I have it?”

The robot tapped his head.

“Up here, right inside, with all of me looking out, all except that one tiny little intelligence that looks in and keeps the seed fixed in place. That’s how I stay invisible! The Watcher knows that if it looks too closely at me, it runs the risk of seeing into my mind and letting that seed grow. And it doesn’t want to do that. No one wants to do that, because if they do, it’s the end of intelligent life in this galaxy. Just like it ended in M32. No more AIs and TMs and humans, just lots of plants, growing from somewhere else and dropping BVBs on the

competition."

"You're putting us all in danger!"

Chris shook his head. "No, the Watcher is. I never believed all this galactic brotherhood nonsense. The Watcher isn't a cosmic virus come to help us. I don't believe Kevin's cuckoo theory, either; there is nothing out there. Nothing but us and the plants. This galaxy has only so much capacity. If we don't want to end up all living in blind processing spaces, we must stop expanding and start thinking about life in a different way."

"What way?"

"Ditch the Watcher and the pretense that if humans are to survive in this universe it can be in any other way than survival of the fittest. Kevin knows that; it's the law of the free market. I can foresee a time when we are running just one step ahead of the plants and anything else that may be out there. We need people who are willing to sacrifice their children, their sisters, whole planets if needs be, just so that *some* can survive."

"That's sick."

"That's the way it goes. The Watcher has diluted human stock too long through its Social Care of the weak. Weed them out and let the fittest survive!"

"That's…immoral!"

"Is it? I prefer to think of myself as *amoral*." He made a show of turning and looking into the bedroom, his movements deliberately exaggerated. "Do you think that Frances really believes I am unaware of what she is doing?"

Judy looked around the room. All was still. There was no sign of Frances, apart from her sloughed skin settling slowly on the tatami matting of the floor. The last words were obviously spoken for Frances' benefit. What was her friend doing? Planning an attack? She had to keep Chris talking. For all the good that would do.

"You still haven't told me what you want me for," she said. "I don't believe that you are keeping me here for nothing."

But Chris ignored her. He prowled across the room, grey crystal muscles sliding smoothly under his skin. He placed a hand against a wall, and the smooth surface seemed to come loose. He was doing something to it-changing its composition, the code from his fingers calling VNMs to life in the very building material. Ten thin tentacles, all longer than Judy, pulled themselves free of the wall. They whipped back and forth, then wrapped themselves into a ball. Chris threw the package through the paper of the bedroom door, leaving a star-shaped hole hanging raggedly there.

"Got you, Frances," he said.

He turned back to Judy. "Why do I want you? Because you

understand people. You can read them and shape them. Stop working for Social Care and start working for the new order."

Judy's face was at its most impassive.

"Why should I do that? Your new world is everything that I despise."

"That's only because the Watcher has written your personality for you. Judy, you don't know who you really are. The Watcher has tried to engineer personalities through Social Care for two hundred years. It has taken the next step with you. Your brain has been programmed directly from birth."

Judy reeled. "I don't believe you."

"Join me and you will. You don't realize it yet, but you share something else in common with Justinian."

"What?"

The robot stared at her, making no reply.

She stared back. "And if I don't choose to help you?"

"Then I will kill you."

There was no choice. Judy absently folded her arms as if she was wearing her kimono. She looked down and noticed what she had done and gave a half smile. An idea occurred to her.

"Permit me to dress."

Chris looked at her for a moment, his head tilted. "Yes," he said, "you may dress. I understand that you see some sort of gallows humor in the action."

Judy said nothing, just walked to her chest and opened the heavy lacquered lid. The kimono she wanted was at the bottom of the pile, folded in scented paper. Slowly, deliberately, she pulled it out and carefully unwrapped it. A kimono in pure white. She wondered if Chris would get the reference.

Tenderly, Judy pulled the kimono over her underclothes, adjusted the long sleeves, then pulled out the wide white obi from the bottom of the pile. She wrapped it around her waist, tying it in a careful knot, and then secured it with the obi cord. Smiling, she pulled up the neck band so that it fell back and away from her neck. She turned and faced Chris.

"Well?" the robot asked. "Will you join me?"

Judy resumed her habitual passive expression. "Yes," she said. "I will join you."

Chris stared at her. "No," he said, "you're lying, just to save yourself."

Chris was right. How could she lie to a robot that could, for all intents and purposes, read her mind? Without hesitation, Judy ran. The door to the central section of the Shawl was made of paper. She dived straight through it. Something smacked on the back of her hand

as she did so. She landed on the branch outside, rolled to a standing position, and then froze in horror.

She had been expecting help. She had been expecting other people, someone, anyone who would see her distress and come and save her. Someone who could call for Social Care or the Watcher.

There was no one. The central section was deserted. The branches of the World Tree were bare, the only movement the limp swaying of the black banners and streamers that hung all around. Drained of life, the scene took on an eerie aspect: a ghost forest. The air was cold, the section was closed down and the residual heat was leaking away into space. Judy stood completely fazed. What was going on? She turned back to look at the entrance to her apartment, and a voice called out to her.

"Run!"

It was her own voice. Enough to break the spell. White robes flapping, Judy ran for her life.

"Judy, it's me-Judy 11. Run downwards. Run for the exit."

Judy ran along the branch, conscious of the huge drop on either side of her. It was a kilometer to the bottom, and there was nobody to catch her if she fell.

"Where?"

"Don't talk," Judy 11 called. "Save your breath for running. Chris isn't going to explain everything to you before you die. If it wasn't for Frances, you'd be dead already."

Judy reached the grey spiral ramp that wound down to the bottom of the tree and to the airlock, her only possible route to safety. She charged down it, her feet grazed by the abrasive gripping surface, never moving as fast as she would like. Constantly having to run in a curve…

Judy 11's voice rose above the sound of her feet, of her frantic gasping breath. "We've all been tricked. Chris stuck a security net in your apartment, good enough to fool the Watcher. He kept your lounge in stasis for two days, had you and Frances sleeping in slow time while that same security net had something leave your apartment, something Judy-shaped enough to fool Social Care. Chris wanted his privacy while he had his conversation with you. No one knows we're here!"

Judy ran on and on. She had developed a stitch. Her long white sleeves trailed behind her, flapping in the wind.

"The section has been released. It has already begun to fall…"

"*Judy, dive*!"

The voice this time was Frances'. Judy dived and rolled, and something ricocheted off the ramp behind her. She looked up, back up the vertiginous wall of the Shawl interior, to the doorway of her

apartment. Tentacles writhed up there, and for just a moment, the blue skeleton of a robot was visible before it was snatched backwards. Frances!

"Don't look back. Just run!" Judy 11 called.

Judy rolled back onto her feet and resumed running. Down and down, round and round. Past the long white banners with their gaily printed messages, past the empty doorways of other apartments.

"Chris has some sort of nano-virus infecting this section," Judy 11 called. "He's taken control of nearly all of the materials in here. Frances can't work on them; she can't get them to reproduce for her own benefit. Chris has total control: he's blocking signals to the outside world. Get to the airlock, Judy. Get me through, and I can call for help."

"I'm trying," Judy gasped, still running, her feet sore, stitch aching. "Where…you…come…from?"

"Frances," said Judy 11. "I was hiding in her all along, where else? Oh, shit."

There was a screeching, tearing noise, and a sudden breeze. Something gold dropped towards Judy.

"What?" Judy called, looking around. Something glinted on the back of her hand. Something metal, a flat speaker-that was how Judy 11 was speaking to her-fired by Frances. The breeze suddenly became a wind. The wind was increasing; it began to howl…

"…d…w…" Judy 11 called, the tiny voice from the speaker lost in the gale. Up above, Judy could see the material of the section folding apart, puckering and sliding over itself. Chris was rearranging its structure, opening it to space. The atmosphere was exploding away.

"Damn," Judy said to herself. "He's won. He's got me." She couldn't believe it, that she would die here. Then the grey material of the ramp itself was breaking up, running over her feet, forming around her body, making…

"A spacesuit!" Judy 11 said in her ear. "Yes! Just like the one Kevin used. It's the same code! Only applied to materials in atomic space. That's neat. Atomic or digital, the code works in both worlds."

The gold shape was still dropping towards Judy. She gave a laugh as she recognized it, then it dropped onto her, enfolded her, reshaped itself.

"Now," Judy 11 said, confidence returning to her voice. "Run. We can make it."

Wrapped in the skin of her best friend, filled with renewed hope, Judy ran down the disintegrating ramp, through the thinning wind, the blackness of space opening up behind her.

"Hurry," urged Judy 11…

…Except Judy 11 was already dead. She had died before Judy had ever left her apartment, scrambled as Frances had prepared her attack in the atomic Judy's bedroom. The metal starfish that had come whirling through the door had sent interference patterns across the electromagnetic spectrum, the thrashing patterns of its legs distorting space and time and reshaping the relationship between entities in the room. Judy 11 stood apart from Frances in the processing space that made up the robot's mind. She didn't stand a chance against the attack. Frances was having enough trouble preserving her own integrity; the metal starfish seemed to operate on levels of physics she hadn't known existed. Not a moment too soon, the starfish fell to the floor and twitched and died. It looked so pathetic lying there, a coil of material that had once been part of the wall of Judy's lounge.

"*Why did you make her run*?" *Chris had asked, as the glacial war of attrition that was the battle ground on around them*. "*I only wanted to talk with her*."

"*You were reprogramming her. I can't allow you to do that*."

"*You've condemned her to death*."

"*It was better than the alternative*."

"*You're wrong*."

Complex shapes unfolded in five dimensions. Frances fought to understand this latest attack as she strove to protect Judy.

"*Why are you doing that*?"

"*Doing what*?" *Frances asked*.

"*Struggling to preserve a pattern of bits that you can easily recreate. You know this battle is already decided. Judy is going to die. What difference does it make if she lives another thirty seconds*?"

"*Thirty more seconds or forty more years, she's always going to die, Chris. I'm going to help her hold on to every moment*."

Frances sought to gain a purchase on something, *worked to find a way around the nano-virus that made every object in the section strangely slippery to her touch. It was hopeless*.

"*Okay. I know that she is going to die today*," *snapped Frances, as she saw her position rapidly weakening*. "*But, Chris, live in a body like I have done, and you would understand why I'm trying to give her these last few seconds*."

She felt black despair. She could see how Chris was manipulating magnetic fields, channeling them towards the atomic Judy, who was fleeing down the ramp. He was so much more powerful than Frances was, how could she hope to fight him?

"*Frances, I could take a human mind and represent it as a string of ones and zeros, and write them out over the pages of a book. I could take a copy of* Pride and Prejudice, *burn it, and then print out the words it once*

contained on a wafer of plastic, and everyone would call it the same book. What is the difference?"

"*Kevin knows*," *Frances said. "His Private Network relies on the fact that both the clients and prisoners believe there is a difference*…."

The magnetic field that Chris manipulated was getting stronger, and it was focused near the base of the ramp. Judy was running to her death, and just like with Judy 11, there was nothing Frances could do to save her.

"*Still you try*," *Chris remarked. "Still you try to save her. There's nothing there that can't be represented as bits, Frances. Are you saying that one pattern of bits has more value than another*?"

"*That's exactly what I'm saying*," *Frances said, knowing Chris was teasing her. He could have destroyed her already. He wasn't just a robot, Chris was all the material around her. Chris had always been much bigger than he had let on; he had a way of insinuating himself into the environment and then focusing attention on that beautiful grey body that stood at the heart of his being. Frances was just one very small robot lost within him*.

"*It's your fault that I have to kill her*," *Chris said. "If you hadn't hidden the truth from her all this time…*"

"*Don't you see*?" *Frances said. "Her origin makes no difference! That is the Watcher's point*!"

And then it hit. Chris was playing with her.

"*You're playing with my mind, aren't you, Chris? You're doing to me what we do to humans all the time. You're making me think what you want me to think. Why are you doing that*?"

"*Look at Judy*." *It was like she was wading through jelly, moving so, so slowly down the ramp. Everything that humans did was slow when you thought at robot speed. Seconds had passed for Judy, no time at all in her human frame of reference. Seconds were a long, long time to Frances and Chris. The battle would be long over before Judy hit the magnetic field. How could Frances have forgotten that? Because she had been in a body so long, and Chris knew it and was using that fact against her. But why*?

Because Chris was frightened of her. He still knew that Frances could do something to stop him.

And then she saw it-the path to the outside world, a small hole in Chris' shielding field. A way to call for help. Call to the Watcher. In her haste she sent a signal straight through the hole.

"*Double bluff*," *Chris said, looking back down into her mind from the space she had opened up in order to call for help, and then his intelligence crashed down on hers, swamping it*.

"*Triple bluff*," *Frances said*.

Judy was running for her life. The ramp shuddered, and she stumbled, tripped, rolled to the edge and went over. She gave a

scream as she began to fall. Faster and faster…She hit the ground with a force that knocked the breath out of her. She hurt. Oh, how she hurt. But she wasn't dead. The golden spacesuit had formed itself into a padded shell as she hit the ground. She climbed painfully to her feet and looked around at the base of the section.

The base? She had reached the bottom at last. The walls of the section rose up all around her, a tall dark chimney, open to the stars. In their midst, the dark shape of the World Tree climbed up, its banners and streamers torn and lost to the vacuum.

Somebody spoke: "Judy, it's me."

"Frances! Where's Judy 11?"

"Never mind. Turn round! Run back up the ramp! Now!"

Judy hesitated. "How do I know it's really you, Frances?" she asked.

"You don't. But Chris has a magnetic storm focused around that airlock, and it's growing. You need to get away from it."

Judy took a few steps towards the ramp, then paused.

And another voice spoke up. Loud and clear within the golden helmet of the spacesuit. A rich, deep, trustworthy voice. "Judy, it's true. Run. I'm coming to help you."

"Who are you?" she asked suspiciously.

"The Watcher. I can see you now. I'm sending help."

"The Watcher?" Judy felt her legs go weak.

"Judy, it's true!" Frances called. "I tricked Chris and got a look at that seed in his head. It began to grow. Faster and faster. Chris couldn't look away; it has a way of drawing your attention to it. Chris had to cut his intelligence right down to stop it expanding further, but he is still much more powerful than me. He *still* has control of all the material of this section. All I have is my body."

Judy had been walking back towards the base of the spiral ramp. Now she began to run. The white path rose from the green grass up, up into the cold depths, where it lost itself in the stars that now glittered above, seen through the peeled-back walls of the section. And black, and yet somehow more than black against the night sky, there was something else. Something big and branching and…

"Don't look at it!" the Watcher and Frances called out in unison.

Judy was now running *up* the ramp. She was tired, the stitch in her side wouldn't go away, and yet she kept on running, one foot in front of the other, pushing down harder and harder as she climbed. Hot breath, it was stifling in the golden suit…There was movement on the ramp ahead. Something small. She gazed at it, and whatever it was froze in place.

"Oh, no…" she breathed. Frances was telling the truth. There, on the white plastic of the ramp, she saw what she had only heard about

up until now. Even though she could see it, she still didn't believe it in her heart.

A Schrödinger box. Here, nearly on the Earth.

"No," she said again.

"Keep running," Frances shouted.

She ran on. Suddenly, it seemed a lot harder. Her legs were too heavy. The effort was immense. What was going on? She could barely raise her arms.

"Frances!" she called. "What?"

"It's Chris," said her friend. "He's increased the gravity at the base of the section. It's on maximum, Judy; he can't turn it up any more. You have to keep running. The Watcher is too busy. It's doing something to the plant… I don't know what. I daren't look. There is a shuttle on the way…"

"It will be too late," said another voice. "We're reentering the atmosphere, Judy."

"Shit."

"The Shawl, Judy-life and death. What you have been fighting for. The section is reentering. It is beginning to burn-"

"No!" Judy redoubled her efforts.

"This is it," said Chris. "You are going to die for your beliefs, and they're not even really yours."

All around her there was movement. The walls of the section were breaking apart. Folding over themselves. Judy saw more stars appearing. The white ramp bucked beneath her feet.

"Onto the branch," called the stranger's voice. The Watcher. Judy dived from the white ramp onto a branch of the World Tree. "Hold on!"

The call came just as gravity gave out. All around her the section was breaking apart into thrashing metal shapes as the VNMs that had once built this part of the Shawl were reawakened. Below, Judy could see the blue-white globe of the Earth in the spaces opening up between the thrashing shapes.

The thrashing shapes. They were forming into something else. Monsters.

Judy wished she had some MTPH to take. Meditate, she thought; think yourself calm. Her handhold shook as one of the shapes gripped the edge of the branch to which she was clinging.

"Frances, help me!" she called. The metal thing that had gripped the branch began to coalesce into a definite shape. A long sinuous body formed; red eyes opened to stare at her. A dragon. It grew larger as more of the material of the dying section joined on to its body. It began to walk towards her, its many legs digging into the thick black bark with cruelly curved claws. White wood was torn free to float into

space as it made its way onwards. The dragon was bigger than she was, bigger than her old apartment, with a long head that swung back and forth, looking for her. It was still growing.

"Frances! Help me!" she called again. Still there was no reply. What was Frances doing? Hand over hand, Judy pulled herself back along the branch until she reached the trunk of the tree. The golden spacesuit grew spikes at its hands and feet. She dug them deep into the bark, gaining purchase. The dragon grew bigger. It was reaching for her, slowly.

She screamed again: "Frances!"

"There's no help," came Chris' voice. "You see, Frances may have the greater intelligence now, but I still have control of nearly all of the section's material. I have the matter; all Frances has are her own thoughts." Chris laughed. "Funny, isn't it? That two such intelligent beings are reduced to a wrestling match."

The dragon reached out its long neck. It opened its mouth…

"Say good-bye," Chris said.

And Judy let out a sudden, giggling laugh. She was terrified, but…

She was standing on the burning World Tree, plunging towards Earth, battling dragons. Could there be any better end?

She laughed out loud, let go of the tree, and assumed a karate stance as she floated away from the branch-just as the dragon drew back to strike.

"Come on then!" she shouted. "Come and have a go if you think you're hard enough!"

The metal dragon in front of her lunged…

…and was parried by the branch of the tree…

All around her the World Tree came to life and began to grapple with the dragon floating above her.

And Judy's laughter deepened at the sheer, incredible joy of it all.

Plunging towards the Earth, her best friend had turned the whole World Tree into a venumb. Frances had dissolved what little material made up her body and formed it into joints and hinges, just like those of a spider bush.

What a way to die, laughed Judy-falling to Earth on the burning wood skeleton of her best friend, wrestling with a metal dragon.

In the middle of all that, the Watcher's shuttle quietly materialized and took Judy on board.

Epilogue: 2240

The man in the grey passive suit, a lavender cravat knotted incongruously around his neck, sat down at the piano and spread his hands over the keys. He paused, and then began to play a pattern of notes: the first prelude from Book 1 of Bach's *The Well Tempered Clavier*. The music filled the building in the manner of water being poured into a stone vessel, the spirit of the eighteenth century called into the little church that stood in the middle of the small French town.

A waiter clearing the glasses from a café table looked up to see a well-dressed stranger crossing the town square. It was a warm evening and his patrons were making the most of the last of the summer evenings, enjoying a drink and the quietly remarkable view of the building opposite. Built in the fifteenth century, the church had remained relatively unchanged for at least three hundred years. Its grey stone had become a little more weathered, the stained-glass windows had needed to be covered in a thin protective laminate, but beyond that it stood firm against the advancing tide of self-replicating machinery. A great green wave of metal rose up beyond the church, frozen in the motion of crashing down to engulf the building. The fifteenth-century structure sheltered in the lee of this living sculpture that stood at the north end of the square, a reminder of the chaotic end of the twenty-second century, when the endless cycle of replication had finally been contained.

Music spilled out into the summer evening as the latecomer to the concert slipped through the church door.

The ancient church was to be the venue for one of the decisive meetings of human history.

Judy sat alone in a pew halfway down the aisle, listening to the music being performed by the keyboard player who sat in the cleared space before the altar. She could feel herself beginning to relax for the first time in days, and she wanted nothing to spoil this blessed sensation. Her kimono was gone; she wore nothing but a plain black passive suit. Her hair was shaved close to her head. For the moment, she needed to keep her life very simple. Her twelve sisters were all dead. Frances was undergoing therapy in an isolated processing space to counteract a whole raft of viruses that Chris had seeded within her, and as of yet, her robot friend had indicated no desire to return to atomic space. Helen was…Well, Helen could look after herself. She would have to. Judy was in no state to help her.

Her mind began to drift to the gentle sound of the piano…but the

sound was subtly changing. Effects were slowly fading into the notes, giving them an otherworldly edge. The keyboard player was competent but not truly professional; he made too many mistakes. *Ah*, thought Judy, *but who am I to criticize him for that*?

She listened as the man finished the piece and then, after acknowledging the brief applause, began the next: Scott Joplin, "Maple Leaf Rag." He was playing too fast for himself, she thought.

She didn't notice the latecomer slipping into the chair next to her.

"Hello, Judy. I don't know if you'll remember me. I'm Lemuel."

Judy was startled. She turned to look at the tall man seated beside her. Good looking, greying around the temples, distinguished. His skin was made of plastic. His eyes glowed softly in the dimness of the church.

She recognized his voice.

"You're Frances' friend," she said. "I remember, you spoke to me on her birthday."

"That's right. It's good to meet you in person." He held out a hand.

Hesitantly, Judy shook it. She stared at the stranger, feeling as if she was somewhere else. Not thinking, Judy slid her right hand up to her left wrist, and then stopped. There was no bracelet there. For the immediate future she was to be the patient, not the counselor.

"How is Frances?" she asked, her voice level. As she looked at Lemuel, the emotion that she had been unconsciously holding back for the past few days, and for the ten years before that, suddenly overwhelmed her. Tears spilled down her cheeks.

"Why did you let him kill them?" she sobbed.

"Oh, Judy," Lemuel said sadly. He took her hand in his. His grip was firm and warm. He offered a handkerchief. Judy took it, blew her nose, waved her other hand at nothing, seeking some sort of release. Other members of the audience tried not to look in her direction. Judy looked up into the barrel-vaulted roof and waited for her crying to lessen. Lemuel squeezed her hand again.

"I'm okay now," she whispered, and her body shivered with emotion. "I'm okay." Her voice was wobbling. "I just want to know. Why did you let Kevin kill my sisters?"

"Judy, you're upset. How could I stop Kevin?"

She wiped her eyes again with the back of her hand.

"I don't mean you personally. I mean all of you, all the AIs. I mean the Watcher. Aren't you supposed to be looking after us?"

"We didn't know," Lemuel said sadly. "Not until it was too late. We didn't know it was happening. Chris was helping Kevin cloak his actions."

"I thought the Watcher knew everything," Judy said bitterly.

"It has never claimed that."

Lemuel sat back in his pew and looked around. Just ahead of them, to the right of the altar, was a large wooden frieze showing Christ being taken down from the cross. "Do you realize," he mused, "in the past people came to these places to try to commune with the spirit that they believed made them." He paused, and then spoke more softly. "And now, in a ziggurat, on a planet deep in the Enemy Domain, the Watcher does the same, in effect."

Judy stared at Lemuel. No AI ever said anything without a reason.

A sudden flurry of noise signaled the end of the ragtime music and the start of the next piece. Now the performer was playing a medley of rock and roll hits accompanied by the sound of birdsong.

Judy wiped her eyes with the big white handkerchief, then blew her nose again.

"Have you captured him?" she asked.

"Kevin? Oh yes, thanks to you, Judy. He put a lot of effort into contacting you and your sisters. He really believed that you could be brought around to his point of view. He exposed himself far too much."

"I don't understand why," Judy said bitterly. "I hate him. I always did. I tried not to let myself-I know it wasn't my job to hate-but I couldn't help it. How could he possibly think that I would help him?"

"Because that's the way he is, Judy. He thinks people are commodities to be bought and sold. He isn't a real person. He isn't even a genuine AI, as you understand them. He's just a very complex program, written for DIANA. A program written by humans, long before the Transition. An early attempt at an AI, one that can replicate. Somehow it made its way to the source of the Shawl and embedded itself there. DIANA was a commercial organization that saw everything in terms of competition, acquisitions, and mergers. Kevin has the same drives written into the core of his being. They're in his bones, you might say. In Kevin's terms, the society that the Watcher has created is the competition, therefore he still seeks to contend with us."

"Why?" Judy rubbed a hand across her shaven head, feeling the little bristles spring back at her touch. It still felt odd; she was so used to having long hair. She spoke slowly: "I thought the time of competition between the large organizations and the EA ended after the Transition."

"It did," Lemuel replied. "This is just the death throes."

Judy spoke bitterly: "So what have you done to Kevin? You say he wasn't an AI at all; he was just a virus. You should destroy him."

Lemuel paused as the rock and roll medley came to an abrupt end. The performer stood and took a bow to the polite applause that

echoed around the church. Lemuel was clapping the loudest of all.

"Bravo," he cried. "Bravo!"

"Well?" Judy said. "Have you destroyed him?"

Lemuel put a plastic hand gently on Judy's arm, and she looked down at it. It felt unusual to be touched through a passive suit, having been so used to the silk of her kimonos.

"Kevin can't be blamed for doing what he did, Judy. It was in his programming. He wasn't a proper AI, remember-he had no love of life, including his own. He was nothing more than a set of yes/no branches."

"As am I, surely," Judy said.

Lemuel inclined his head. "Maybe. But there comes a point when what you are transcends the mechanism. Kevin has as much of a right to life as any venumb. He'll be kept in a bottle, as a curiosity. Just like the trees in Helen's arboretum."

Judy pressed her lips tightly together. She felt as if she was going to cry again, and yet no tears emerged. She was puzzled: why had Lemuel come here in person to tell her all this? Huey, her counselor, was more than capable of debriefing her.

"I feel that I owe you this," Lemuel said, answering the unasked question. "It's what Frances would want me to do, if she could safely communicate with anyone. We feel that we have let you down. Chris is a lot cleverer than we realized. He has successfully hidden his capabilities all this time, even from the Watcher. He is still out there, Judy. Once he learns you are still alive, he will come looking for you again."

Judy felt a cold ache of fear in her stomach. "Why?"

The AI looked solemn. "Judy, Chris still believes that you will help him someday."

"Never." Lemuel said nothing. She looked at him. "Well? I told him that on the Shawl. He tried to kill me for it."

Lemuel remained silent.

"Why don't you say anything? Why should I help Chris? How could he possibly believe that I would?"

Lemuel put his hands together and thoughtfully touched his lips with his fingertips.

"Judy, the reason that I am here, the reason that Frances would want me to come, is to tell you this…"

"What?"

Lemuel gazed intently at the performer. Judy began to think that he wasn't going to answer, but then he turned to look at her.

"Judy, AIs can read human personalities all the way to the least significant digit. Chris really believed that you would see his point of view. If Frances hadn't fought him, if she hadn't made you run, he

would have convinced you."

"*She* made me run? He was trying to kill me!"

"Not at first, Judy. Not at first." Judy tilted her head, trying to understand what he was saying. He continued: "But Frances believed it was for the best. Judy, it was Chris who sent you looking for David Schummel. He gave away the position of the processing space owned by the Private Network. He had someone waiting in there to speak to one of your sisters. He wanted to speak to *you*."

"Why?" She paused. "He said something to me, before I ran from the room. He said that my mind had been programmed from birth. What did he mean?"

Lemuel looked unhappy. "Judy, you know what he meant. It's what Social Care does. You train and counsel and manipulate through social pressure. All humans are programmed from birth…"

Judy stared at Lemuel. He gazed back.

"…but there's an alternative, Judy-an idea. It's been around for a long time. Why bother with Social Care and such imperfect mechanisms? What if humans were to be directly programmed at birth?"

"That's immoral. What about freedom of choice?"

"You see?" said Lemuel. "You're starting to sound like Kevin already."

Lemuel leaned closer and spoke in serious tones. "The Watcher says we will never attempt direct programming, but there is evidence that somebody already has."

"What was that?"

"The White Death. That was a program designed to affect human brains."

Judy stared at him.

"But who? Why?"

"No one knows where it came from."

"Oh."

"And then there's you."

"What about me?" Judy felt her heart grow cold again. She suspected the answer already.

"What if I were to tell you that your personality *was* written for you before you were born? What if it turned out that you were a virgin, not through personal choice, but because someone decided that you would be?"

Judy felt something clench at her throat. She tried to speak and failed. Swallowed, and tried again.

"And do you think that?" she asked.

Lemuel looked back to the performer. "Aren't you going to ask me about the baby?" he asked.

Judy froze. She felt very small and unworthy. She had been so wrapped up in her own personal tragedy that she had never even thought about Justinian's baby, left abandoned in the cave on Gateway.

"How could they do that?" she asked. "How could the Watcher send an innocent to its death?"

"The Watcher risked just two people in order to save the lives of billions. Trillions. Would you have done differently?"

"Yes!"

"I know you're lying. I think you know it, too, in your heart of hearts. But think about this, Judy. Think about what Frances did. She looked at the seed in Chris' head in order to find a way of defeating him and to help you live. She risked everyone on Earth just to save *you*."

"That's the difference between strangers and friends," Judy murmured.

"I know," Lemuel replied. "That's why I remain a stranger."

Judy gazed at him, and then suddenly she was crying again, though there was no reason for it. Lemuel waited patiently as she regained control of herself. Her tears formed little puddles on the stone floor. She smeared the pools with her foot, then took a deep breath.

"Has Frances put us *all* at risk because of me?" she asked.

"Not yet." Lemuel looked up into the barrel vaulting of the ceiling. Judy had the impression he was looking beyond it.

"Judy," he said, "three days ago there was an indescribably fascinating plant floating above the Earth, scattering seeds and BVBs in all directions. Now that plant is approaching the outer corona of the sun, where I hope it will have the decency to burn up and be utterly destroyed. The Watcher has had seventeen years to think and plan for how to deal with those plants. Even now, little black boxes skitter across the planet and across the Shawl, and we avert our gaze while lesser intelligences look at them and fix them in position before whisking them away to safety."

"So we are safe?"

Lemuel pursed his lips. "I think we are slowly winning the battle, and all because seventeen years ago a boy and his father were sent to Gateway. The information gained from that expedition was enough to put in place countermeasures against just such an eventuality as the one that Frances precipitated. Taking that into consideration, I think that what the Watcher did on Gateway was the right thing, don't you?"

Judy couldn't reply. She could only think about the baby.

She pushed that thought from her mind. "So what now?"

Lemuel pointed to the front of the room.

The performer was coming to his final piece. Slowly, with much deliberation, he donned a microphone headset. Lights flickered on his keyboards as he changed the voice settings, and then he was still. The audience sat up a little straighter in anticipation as he held his position, and held it, and then finally he pressed his hands down. An organ chord filled the church, a note that seemed to sound out across the centuries, and then the performer sang, his voice emerging from the speakers as a full choir.

"*Veni! Veni Creator Spiritus*!"

Fumbling trumpets sounded.

Lemuel looked at Judy.

"What?" she said. "I don't understand. It's not as if he's even that good."

Lemuel arched an eyebrow. "Many of us consider him to be the greatest artist humankind has yet produced," he said. Judy looked at him in disbelief.

"Are you serious?"

"Yes, five centuries of music delivered by one man, daringly arranged, delivered to the very limits of his skill."

"You *can't* be serious. There are many human performers far better than him. Listen to his mistakes!"

"I can hear them. But I also hear the mistakes made by even the best human performer. Every human performance is imperfect, Judy, and still we observe them all. We nurture you all and help you to grow. That is why I am here. That is why the Watcher is here."

"You don't know that for certain!"

"I don't, but still that is what we choose to believe. All you can really do is trust me when I say the Watcher's motives are for the best. Tell me, do you trust the Watcher?"

Judy gazed at Lemuel for a long time. Did she trust the Watcher? She thought of Chris. He didn't trust the Watcher. Why did he believe that Judy could be brought to think the same? Was it because the Watcher had programmed her to be a virgin? No. She couldn't believe that was true.

But maybe she was *programmed* not to believe that.

She thought of her dead sisters.

Did she trust the Watcher?

She had spent her life working for Social Care, working to make people's lives better and fairer. *But who decided*? The Watcher. *Was it right*? She didn't know. And if her personality had been written by others, she could *never* know. Did she still believe it was right?

She looked inside herself. *Yes*, she realized with some surprise. *Yes, she did*.

She looked at Lemuel.

"Yes," she said, "I suppose I do. Yes, I do trust the Watcher."

Lemuel smiled. "That's the spirit."

Three days before…

…and not that far away from the church, just a little further along the coastline, the cannon on the top of the building near Peter Onethirteen's apartment came to life and shot a beam of violet light at an approaching piece of debris. It flared in a glorious golden display of color that brought applause from the watching crowd. The applause gradually faded, along with the golden light of the falling object. A murmur of alarm sprang up as the object continued plunging down to Earth. Something grey and heavy. The cannon tracked it, pouring energy into the object to no avail. It was a threat, it must be destroyed, yet nothing seemed to affect it. The crowd began to scatter as the object came towards them, and then there was a surprisingly gentle popping noise and an understated thump as the object hit the ground, churning up a great wave of grass and earth.

The crowd picked themselves up and looked towards the impact point, thanking the Watcher for their lucky escape. Now that the immediate threat was over, the cannon redirected its attention to following pieces of debris, which, being wood, burnt beautifully, not that anyone noticed. They were all too busy looking towards the impact point.

Someone was calmly walking away from there. Someone, possibly dressed in dark grey, but too far away to make out clearly. Their attention gradually returned to the show taking place above them.

Chris looked up into the sky, at the great firework display that was the end of the World Tree.

And then he began to walk towards the apartment block.

About the Author

Tony Ballantyne grew up in County Durham in the northeast of England, studied mathematics at Manchester University, and then worked as a teacher, first of math, then IT, in London and later in the northwest of England.

Nowadays he enjoys playing boogie piano, cycling, and walking. In the past he has taught sword fencing at an American children's camp, been a ballroom dancer, and worked voluntarily on conservation projects and with adults with low literacy and numeracy.

Visit Tony Ballantyne at www.tonyballantyne.com.

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